MOTOR AGE

Vol. XXXIII
No. 17

CHICAGO, APRIL 25, 1918

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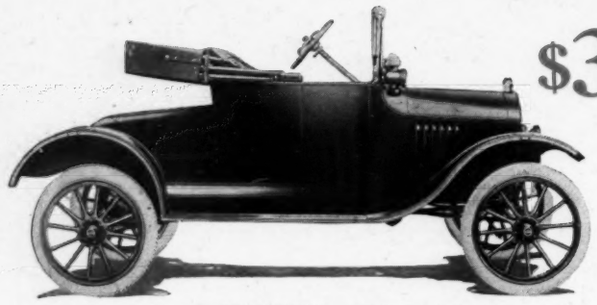

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MOTOR AGE

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MOTOR AGE

Battles in Midair

By Sergt. Jean Lerche

SERGT. Jean Lerche is a Belgian who is credited with sixteen German planes. All his aerial operations were in two-man seaplanes which he piloted under the guidance of his observer, Lieutenant Le Claire, since killed. The Belgian was invalided out of the British Naval Flying Corps after receiving injuries in a fall of 9000 ft. He is at present visiting in the United States awaiting orders to return to the front in the tank corps, his fourth enlistment since the beginning of the war in 1914. He is a married man with four children. For the last three years his wife has been a 12-hr.-a-day laborer in British munition factories. She not only has supported the four children but a Belgian orphan has been adopted into the family. The two brothers of the sergeant are with the American forces in France. His only sister, from Winnetka, Ill., is in France with the Red Cross.

THE thrill of air fighting can be described only to that of coasting down the side of a mountain on a pair of skis with a series of fences in front of you, each having an open gate, but with the gates irregularly placed, here and there, so that you constantly are dodging back and forth through the gates at the wild pace that the slope gives you. It is the super art of doing things quickly. Possibly you landlubbers would say, "Why, you have the whole heavens before you. It would seem that such vastness would give you plenty of place to get around in." But that is not so. There are just as many hills and gullies and thank-you-ma'ms in the air as are on land.

To the airplane the air itself is exactly as the road to the motor car. When the air is calm, we are on boulevards and we let her go. When the air is turbulent we are on the dirt roads—but we have to let her to go here too. That is the difference. You with your motor car can climb up to 60 m.p.h. when the going is good, or you can drop down to 3 m.p.h. when you strike the ruts. With us in the air we are shooting along 90 to 125 m.p.h. all the time, regardless of the weather condition, regardless of our air roads. We have simply got to go that fast. If we did not we would fall to the earth.

So you see what I mean when I say that flying is the super art of doing things quickly. And military flying is the maximum of that super art. Can you imagine a great open field filled with racing motor cars dashing around 100 m.p.h., trying with machine guns to kill the operators of these cars? It sounds foolish does it not,

"'Quick,' said my commanding officer, 'he is right in the beam.'"

"I pulled my automatic and rushed at the German machine, expecting resistance. There was no little surprise when he, smiling, threw up his hands and said, 'Kamerad.'"

but air fighters do virtually that. The only advantage they would have over the racing cars is that they can go over and under each other, and I believe that a good deal of argument might transpire as to whether that is really an advantage.

It is indeed difficult to present a word picture of the feeling of fighting in the air. There is nothing to compare it to, and how can one describe in an understandable way without comparison? When I came to the United States I soon learned what the question was that I would be called upon to answer most often, and, although that question, "How does it feel to bring down a German airplane," has been advanced to me hundreds of times I have not yet been able to give a really comprehensive answer.

A Pilot of the Air

Possibly my answer, however, I might express it, would not be a characteristic case anyway, because my business in the air was not that of shooting at a Boche airman. It was the more mechanical and less romantic job of guiding my machine so that the lieutenant I drove could do the shooting. That was my own thought in all my air battles, scientific maneuvering, and so I say in the simplest terms that the feeling which follows victory over a German flyer is that swelling pride of outmaneuvering a man who was trying to out-maneuver you.

Things happen too quickly in the air to allow one to have many thoughts other than the actual business that is at hand. One hundred miles an hour! That is a tremendous speed, and remember, we are shooting at Germans at that speed and they are shooting at us. I know of no form of fighting which combines the elements of luck and skill in such even proportions. Fighting at the mad paces of airplanes cannot be all skill. A man cannot think quickly enough for that. He must be skillful as fast as he can think and trust to luck for the rest.

The stories of my fighting are rather the unusual. I do not belong to the class of romantic battleplane aces who have won their stripes in thrilling encounters over seething trenches. I was on the edge of things, the patrol which had as its duty the saving of lives of English women and children and the retaliatory action of bombing German city for English city. Most of my work was done in seaplanes, and my fighting area was the English channel except in a few instances. Yet there is a thrill in fighting the raiding Boche, and indeed, there is a satisfaction in driving to the earth one of these heathens dispatched on their bloody mission of slaughtering defenseless non-combatants.

In my early flying training, there seemed to be every reason to believe that I was going to be a dunce flyer. I could get the training machines in the air with little trouble and the flying around part of it, up in the air, was mastered easily, but getting down again. If you want the sensation of your first landing in a plane, climb up to the top of a cliff, jump off toward an overhanging tree and then save your life by catching the tree on the way down. The mental disturbances between the top of the cliff and the tree will be comparable to those of bringing a plane to earth. I smashed four perfectly good training machines in my training and I really believe that my superior officers debated considerably as to whether I was worth the expense I was causing the government.

Finally, however, I received a pilot's license from the airdrome at Hendon, England, on the 14th of December, 1914, and was dispatched for sea service with the combined naval forces of Great Britain, Belgium and France. I greeted my first German airman in the pitch black of 4 o'clock in the morning. The date was Jan. 15, 1915, and the combination of early morning blackness, winter weather and altitude coldness made fighting a real business. We were stationed at that time on the English coast. Shortly before our battle a squadron of German planes, flying at very high altitude, had slid through our defences unobserved and bombed the outskirts of London. It was up to us to try to get them on the way back, and the fact that we did is a miracle.

An 18,000-ft. Climb

Lieutenant Le Claire and myself were entrusted with a Bleriot two-seater at the time. One of the old 90-milers with a side shooting weapon which shot often and jammed more often. We climbed to 18,000 ft. before the Germans got back from London. There were six of us up and we were cruising in the dark when suddenly the land forces learned of the German approach. In those days the Boches flew in bunches and they ran true to form on this night. I could not see a German; I could hardly see the land; just a few dim lights here and there, and the suspense of the thing was terrific. There was beautiful work on the part of the land forces that night. They traced the Germans, waited for them, and when they knew, by intuition I guess, that they were among us, the searchlights burst their powerful beams into the sky.

"Quick," said my commanding officer, "He is right in the beam."

I looked down, and saw, far below, an Albatross trapped squarely in the blaze of one of our land lights. Here was business ahead. We were directly over that German and we were on a salary and on a moral obligation to our country to go after him and bring him down. The thoughts which coursed through my mind were not romantic, heroic or of a heart-fluttering nature. There was the excitement which

naturally would arise from the demand for quick and accurate action, there was the tenseness caused by the thought that a slip in calculations would spoil the whole thing.

Directed by my superior officer to go after him, I turned the nose of the Bleriot down and made a sheer nose dive of over 2500 ft. This brought us within a range of 100 yd. of the flying German and we were going some after the precipitous half-mile drop as you can well imagine. It was really a peculiar sensation, this reckless dive through the darkness. We had no idea of the location of the other machines, we did not know what was in our path in the darkness. There was only one objective that we could see, and that was the black outline of the German machine in the beam of the searchlight which followed it.

If the searchlight had wavered we would have missed him. But it did not waver. I could not estimate the speed that this nose dive had given us, but it was fast enough so that the pressure of the air against the propeller blade was forcing the engine to race beyond its normal operating speed and the wings were shivering like a loose awning in a heavy wind. Despite the fact that I was obliged to right the machine rather suddenly when about 100 yd. over the German, throwing the balance of the machine into another plane and jerking things around in a reckless manner, my cool, nervy lieutenant brought his arm around and dropped incendiary bombs into the enemy fuselage. One belt of bullets was enough. The Albatross catapulted out of the beam of the searchlight and, as I later learned, plunged into the sea, killing both pilot and observer.

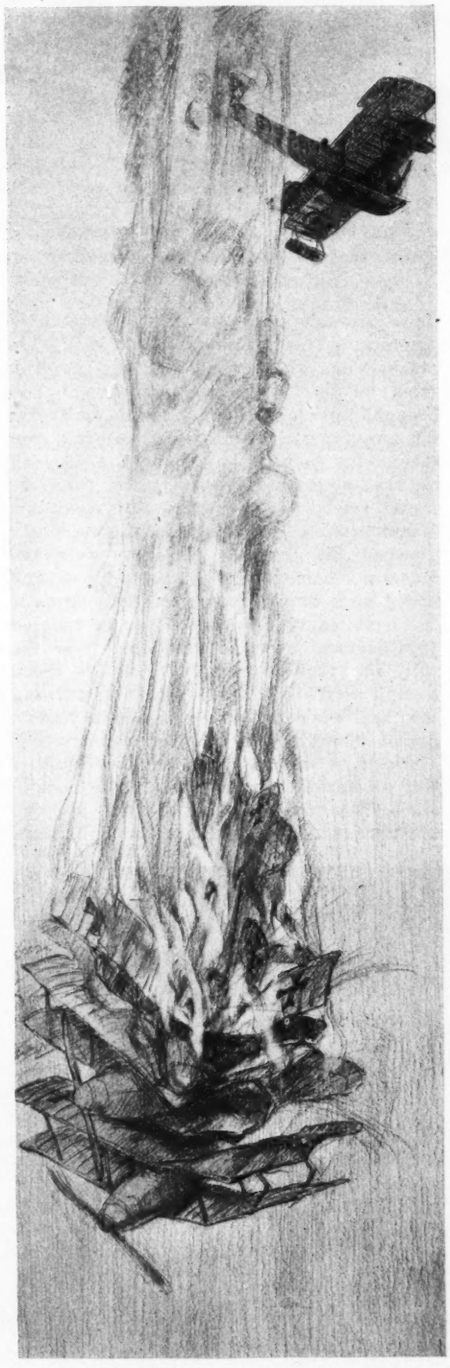
Into Total Darkness

After the six Allied machines returned to camp the combined reports given to our commanding officer Le Blanc revealed that we had sent the entire enemy fleet, eight planes, into the sea, and this in total darkness. The German mass formation, the slower machines of those days and the expert handling of searchlights were the complete undoing of a German raiding squadron. Things are different nowadays. They will not fly in mass formation as they did and their machines are faster and capable of dodging out of searchlight beams. We were teaching them lessons in 1915.

What were my thoughts when I returned to the ground after bringing down my first enemy plane? You would ask me that question in person. Everyone does. My thoughts were that I was fortunate in being associated in my flights with an unusually clever lieutenant and that I was mighty cold and wanted to find a nip and a hot stove. I will confess that the last thought had most prominence in my mind.

The next air fight I had was on the 21st of February, 1915, while on an observing mission over the German submarine bases at Zeebrugge. This time it was in the bright of day, 11 o'clock in the morning, when Le Claire sighted a German Fokker monoplane heading toward Lyons. I was still using a Bleriot and it was a fast two-seater for those days. If there is humor in war, there was an uproar of mirth in this, my second air battle. I pursued that German machine for an hour and 10 min., up and down the beach between Nieuport and La Panne. I had the speed, and thus the advantage. The machines of those days did not allow the acrobatics that they do now, but this German went through everything his machine would permit. He would nose dive, turn, spin on a skid, but always I kept above him, thanks to the speed of my Bleriot.

It was really laughable. Lieutenant Le Claire was serious over the thing during the first half hour, then he got into the fun and I heard his frequent bursts of laughter when we out-maneuvered some new trick of the German. Finally, at an altitude of 12,000 ft., the height that we had averaged throughout the chase, I got him within gun range, and Le Claire cut loose.



The two machines tangled together and dropped, spreading over the third in a regular umbrella of flames

The enemy observer was seen to drop over in his seat, and the machine careened wildly toward the beach. I looked for a crash, thinking Le Clairie's shooting had got both the observer and the pilot, but the machine righted and landed smoothly on the beach.

It was a rather unusual situation. We had made the observer hors de combat. About that there was no doubt. But here was a healthy German pilot lighting on the French coast far from any military or naval outpost, and we, his pursuers, still up in the air. Another case where one must act without deliberation. I plunged toward the ground, righted my machine almost too late and made the most reckless landing I have ever made or ever will. It was feverish excitement that caused me to make that desperate landing and it was the alertness that this feverish excitement had created, together with a good portion of the element of luck, that brought me smoothly to the water instead of crashing nose first under the waves. The machine had no sooner come to rest, some 100 yd. behind the German, than I waded to the beach. He had a land machine and I a seaplane. It was easier for the pilot to get out than the observer in those types. I pulled my automatic and rushed at the German machine, expecting resistance. There was no little surprise when he, smiling, threw up his hands and said, "Kamerad," the first German and the only one that I captured with my own hands.

A Cigaret from the Enemy

Lieutenant Bower of the German army looked pityingly at the dead body of his observer, shook my mand and congratulated me for the persistance with which he had been followed and offered me a cigaret, which I accepted. Was there ever a more mannish act than this? My enemy, my captive, of a race I hated, yet as naturally as you in your office would offer an incoming guest a cigar, he passed me a cigaret, and with no thought other than man-to-man courtesy I accepted it and accepted his proffered light—from a Swedish match.

Shortly after this strange ritual a detachment from the coast guard, who had witnessed the landing of our two machines from a distance, came up and I turned over Lieutenant Bower as a prisoner of war. We buried the observer in a cemetery in Flanders with brief military courtesies.

The third engagement in which Lieutenant Le Claire and I brought down German machines was a land-fighting proposition, and I am frank to confess that I did not favor it in comparison with fighting over the sea. When one is up 10,000 or 15,000 ft. he has no more chance over water if he loses control than he has over land. Falling from such a height makes water as hard as the land to fall onto, but it gives one an entirely different feeling at that. That smooth blue expanse of the English channel is so restful looking. The trees and houses and dirt of the land is a most uninviting falling ground.

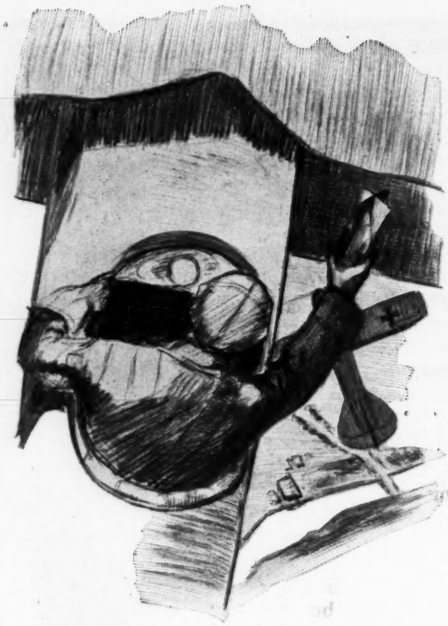
It was a hot fight that we had over Callais in France on the 4th of April, 1915.

The Germans with a fleet of twelve Albatross bombers, had attacked the munition plants of Gravellines and had done a terrible damage. As was the frequent case then, they had gone into our territory and done their damage before we could get our machines into the air. But we were ready for them on the way back, twenty-four of us, and out of the twelve machines our planes brought down nine. Of those nine my lieutenant accounted for two, dropping incendiary bombs from above the enemy planes. This man Le Claire was uncanny in his manipulation of incendiary bombs. His accuracy was wonderful. It was only necessary for me to maneuver the machine over a German plane within a reasonable height and he would drop a bomb over the edge. It usually would get a wing and, as was the construction of the bomb, would burst into flames immediately upon contact. The two machines which we got this day fell in a mass of flames into French territory.

My fourth successful air battle recorded a happening which as far as I can find out by careful observation of all available records never has been duplicated. It was a freak in the annals of war air fighting and is of no especial credit to anyone. What happened was that, with one incendiary bomb Lieutenant Le Claire brought down three German machines.

It was on the 25th of May, 1915, that a German fleet of planes bombarded Ramsgate and Chatham on the English coast with aerial bombs. We again trapped them on their return. We went up with twenty-two machines and joined a squadron of the British Royal Flying Corps, land machines, numbering eleven. That made thirty-one allied machines, seaplanes and battleplanes, in the air greeting a squadron of twenty-one Albatrosses. Of their twenty-one we brought down seven and lost three ourselves.

But as to the three that fell at once. Flying high, we waited for the Germans to pass under us, then we nosed-dived into them. They became rather panicky because they were outnumbered and badly trapped. Two of the Germans witnessed my drop over their head and they turned



"This man Le Claire was uncanny in his manipulation of incendiary bombs"

down also, swinging directly under a third machine. Thus there were three Boches stacked one above the other and ranging from 50 to 75 yd. apart. When I had brought up over the top machine Le Claire let loose, with his unerring accuracy, an incendiary bomb. It caught the German on the wing directly beside the fuselage. Panic seized the German pilot when his machine burst into flames and he evidently dropped his controls. At any rate the machine immediately nosed down and dived at a terrific pace directly on top of the next machine down. The two tangled together and dropped spreading over the third in a regular umbrella of flames. Such a sight! This tangled mass of burning silk and wood with its trapped-in human bodies plunging down, down into the sea.

This feat was not all that stirred me on this memorable day. I had made considerable of a chase during the battle and the business of killing had been so uppermost that the business of flying had become forgotten. Mind you, all this fighting took place from the English coast across the channel to the Belgian coast.

Lieutenant Le Claire shouted congratulations to me, I hailed compliments back—and our engine stopped. I was over the sea, yes, but where? Looking down we recognized landmarks which told us that we were very nearly over the German defenses at West Duine. I whirled my machine about and glided with the least possible angle toward the sea and away from the Germans. But we had not gone far when the German anti-aircraft guns got our range and started after us. We swooped into the sea amdist a spray of bursting shrapnel. It was death at our door. I was truly afraid. If a man is standing on land with a good pair of legs under him and some one starts shooting he is less afraid than he is in a hurry. It is his prime thought to run and get out of the way with the least possible time consumed. But here we were strapped in a plane, bobbing up and down in a hot fire from good-sized guns. I did not think of running. I knew I couldn't. There was nothing else to think of but death—and I was truly afraid.

Swept to Sea

To our salvation I give all credit to nature, and I have loved her more since for it. As if by providence a squally offshore wind sprung up and swept us rapidly out to sea. The shells which had been bursting within 10 yd. of us, fragments of which had passed through the wings, began to fall short in the water, we gradually drifted out of their range and, it reads like a melodrama, a French torpedo boat rushed out of the mist and rescued us. As I stood on the stern of the torpedo boat and looked down upon the faithful Bleriot, being towed at the rear, I could not help but think of the comparison of the stability between that destroyer on a firm body of water and that fragile thing bobbing around on nothing but air.

I was reported for the Military Feld Cross following this engagement and Lieutenant Le Claire was given the Croix De Guerre.

My next two successful engagements contained nothing particularly unusual. In the first we were dispatched to bombard the German airdrome of Ghistelle, near Brugge. We were attacked after dispatching our bombs by anti-aircraft gun fire and later found ourselves in the midst of fourteen German machines. There were eighteen of us. Again I was fortunate in having the upper hand. I was flying at a height out of range of the anti-aircraft guns and had the top on the German flyers. In the few minutes of fast and furious fighting Lieutenant Le Claire got his machine gun fire into one German, crashing him, and we drove another into Holland. I was flying in this engagement a Farman plane, a good climber and fast. Six of our machines, unfortunately caught lower than we were, were brought down by the land guns.

About this bombing work, the Farman which I drove in this engagement carried as its maximum five 30-lb. bombs. These were toys and the weight carried was, of course, small in comparison with the modern machines. At that, with this light

Sergeant Lerche in one of the latest Bleriot two-seaters. This picture was taken at the scouting camp of the French air service at Calais

equipment, we scored direct hits on the air-drome sheds and performed considerable damage.

In the other battle mentioned we went up after Boches who had attacked our aviation camp at Moeran. They had done a good deal of damage and we were ordered to get them aat any cost. There were only three of us scouting along the coast for the raiders, this at 8 o'clock in the morning, when we spotted them turning toward their own lines. Again our speed helped and the three of us were on the tails of the eleven raiders in scant time. I never witnessed such a fast fight. There was little intervening space between the scene of battle and the anti-aircraft guns at the German lines and we were obliged to work feverishly. Four Germans tumbled. Who brought them down no one knows and never will. They are uncredited. Lieutenant Lafflange went a little too far and the anti-aircraft guns got him. Lieutenant Terry in the second machine and Le Claire and myself returned safely. I have recently learned that Lieutenant Terry was killed March 7, 1918, after bringing down ten machines.

On the 4th of August, 1915, when the Germans inaugurated a terrific land attack on the English front at Ypres, I was called with several other coast guard aviators to assist the French esquadrille. I drove a battleplane on this day, speedy and tricky, but my love was the seaplane and I was glad that I was not consigned permanently to the new mount. It was a two-seater Caudron and, of course, Lieutenant Le Claire was with me. I am proud indeed that I have shared in the credit for all my air battles with this intrepid little Frenchman. He was an even 5 ft. tall and I am 5 ft. 2 in. The planes did not groan under our weight.

Air Full of Planes

That day with the esquadrille was nerve-racking and tiresome, bloody and sickening. The air was full of machines. It was a case of get-the-jump on your opponent or he would get it on you, and we did some dextrous jumping. In the day we brought down four Germans with our Caudron. Why we brought them down instead of the other way around, centers in the one word "luck." It lasted from 8 in the morning until 4 in the afternoon. Up in the air a half an hour, then back for petrol and stimulants, up again and back again. I am glad I am not a battleplane pilot. They are a busy bunch. In the fighting that day was the famous Captain Guynemeyer, most beloved of French aces, who later was killed after he had accounted for his fifty-sixth German. There was also the LaFayette esquadrille of American boys, and a braver group I never saw.

In another battle my brave lieutenant got two machines in one flight. Sept. 11, 1915, we were sent up at 7 o'clock in the morning to try to head off a squadron of Boches flying toward England, one of those daylight raids of theirs. We were too late in the air and could do nothing but chase them across the channel. We went to the English coast and dropped down at the naval station at Chatham. We filled our petrol tanks and at 8:12 the seven of us arose. We climbed to 20,000 ft. and waited, if you can call shooting through the air at 100 m.p.h. waiting. The five German raiders drove straight into the trap. We dropped out of our cloud screens and right into the midst of them. Our machine had position advantage on the others and we got to the Boches first. Lieutenant Le Claire swung his gun first right and then left and got a plane at each firing. The other three got away, all except one, that falling into the sea near the Belgian coast and being captured by an English patrol boat.

I have said that there was no romance in my air fights. Possibly I am wrong and I will let you draw your own conclusions after I have related my next story to you. It was on the 7th of February, 1916, when the German airmen bombarded the town of Furnes in Belgium. We went after them two ways, the Belgian land airmen attacking from one side and our naval division on the side of the coast. I went after one German airman, and he was all that I could handle in that battle. This single duel continued for 20 min. He was a very tricky flyer, but again I had the speed and I kept on top. I finally headed him for the sea and drove him 3 miles out. In a desperate effort to escape me he looped, then seeing that he was still trailed looped again. On this second loop something went wrong and he began to wobble. A nose dive, a volley from Le Claire's gun and he was in the sea. An English trawler picked him up and carried him to Dunkirk.

After alighting on the beach I received a summons from the French commander, directing me to see the German prisoner. The German had asked that he see me. I suppose it was a sort of morbid curiosity to see the man who had brought him down. I made my call, I looked at my victim and was almost overcome.

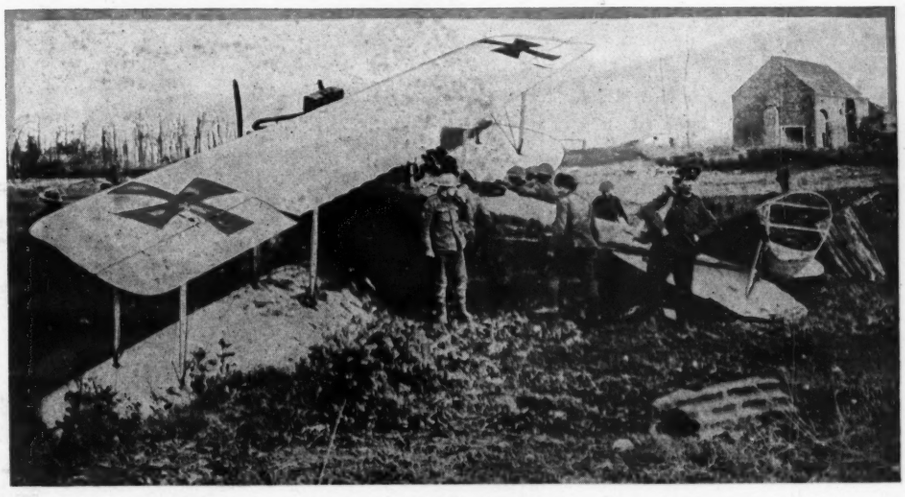
"Herr Richter, as I live!"

"Monsieur Lerche!"

Two pleasure-seeking travelers spent many happy hours together at the Hotel Stephanie, Baden-Baden, in the black forest of Germany. There were many jolly nights back in 1909 in the kurhaus of this famous summer resort. Belgian Civilian Lerche of that pair, now Sergeant Lerche, had captured, had tried to kill, his former companion, German Civilian Walter Richter, now a lieutenant. It sounds like your American moving pictures look. There were thousands of German flyers, there were thousands of English flyers, but fate said that we two old friends were to meet. I was allowed by the French commander to talk with Lieutenant Richter for 50 min. We smoked a cigar together, drank a glass of wine together and talked of the pleasures of Baden-Baden. At the end my friend-enemy wrung my hand and tears came to his eyes.

There were other fights, land fights, sea fights, monotonous observation trips and the like, none of which have an element that would be interesting reading. But my flighting life was to terminate, and in a hairbreadth fashion. I was called back to the training station to instruct recruit flyers. I had been there but a short time when the first Curtiss seaplane arrived. Volunteers were asked for and as I was up in front I got the job to give it its tryout. Four trips I made in that Curtiss plane. I liked the way it handled; it was a good climber, steady on its feet and handy on the water.

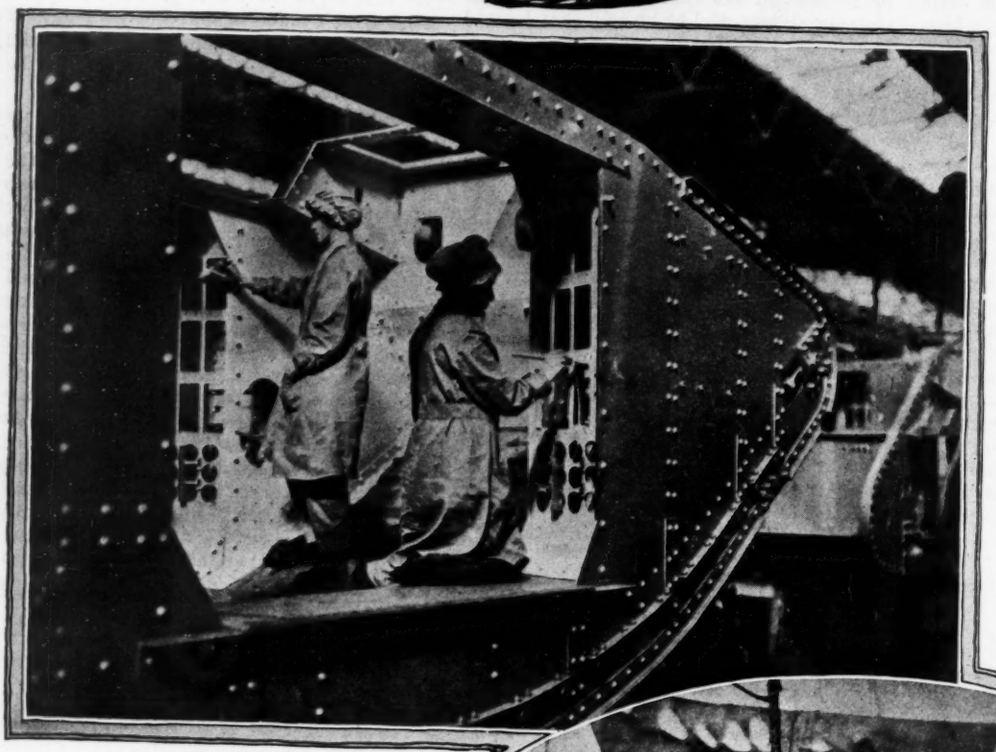
The fifth trip was planned to show its climbing ability, with straight rising into high altitude. I nosed her up hard, the engine laboring to drag the weight at the great angle I had set. Steady and reliable she was up to 9000 ft., when there was a snarling crash. The engine was loose from its supports, the propeller was jambed and what else was wrong I don't know. At any rate there was no controlling her. She nosed her motor car-like hood toward the ground and the air began to scream. I said, "Good-bye, Jack!" and ducked my head into the fuselage. I can't tell you anything about that descent. I had not traveled far before I became unconscious, the wind, the fright and all putting me completely out, but I was walking around again in five days later. Those that saw the dive tell me that the machine broke its nose dive at about 3000 ft., fluttered to about 300 yd. and then crashed into a thicket. That 9000 ft. drop did nothing to me but dislocate a shoulder, stiffen my legs with temporary paralysis and give a few scratches and bruises. Five days later at 11 in the morning I awoke and looked into the face of the most beautiful little French nurse I have ever seen.



A German machine brought to land by an Allied aviator. Sergeant Lerche himself is credited with sixteen German airplanes brought to earth from midair

With the War Motors Here and There

The body of this ambulance differentiates it from others of its kind. The ambulance is a Ford chassis fitted with a body modeled by the French. The chassis was sent abroad, and the French made this body for it out of the box which the chassis was shipped abroad in



British women have been shown at work in practically every industry connected with winning the war. This photograph is the first one to show them engaged in the construction of the British tanks. Incidentally the photograph gives an unusually good view of the interior of a tank, as part of the armor is not in its placce

The motor car horn has taken unto itself a new service in the trenches, as indicated here. It now is used to warn the Americans in the French trenches of a coming gas attack. What has become of the motor car it formerly graced is not told, and it may be that the car has gone where all good cars finally go from this earth

This is part of a 3-mile line of Army motor trucks snapped on their way through New York on the final stretch from Buffalo to the Government point of embarkation. More than 150 khaki-colored trucks are in the procession, one of the longest ever seen. A close-up of a few of the trucks is given at the right, in which the flag plays a very prominent role also

This is a promise that will be fulfilled. The boys of one of our motor truck companies Over There are advertising what they are going to do to the kaiser when they get him, while Over Here we are buying Liberty bonds to back the "We'll get him" trucks

Army Motors Will Be Co-ordinated

Changes Embody Complete Revision of Military Truck Service in Washington

WASHINGTON, April 22—Special telegram—Momentous changes embodying complete revision of the military truck service are taking place in Washington to-day. Christian Girl only came to Washington for a period of six months and has had his resignation in since January to take effect May 1. From his position as director of motor transport service for the Quartermaster Corps, Mr. Girl, who came to Washington last fall and assumed charge of engineering, purchase, procurement and maintenance of the standardized war trucks, has created an efficient organization composed of skilled motor car engineers, production men and specialists. He has witnessed the beginning of quantity production of the standardized truck. Nine hundred and sixty class B trucks have been completed, and more than 1300 will be finished by the end of this month. The design and contracts for the A and AA trucks have been arranged for. In consequence Mr. Girl believes that he has completed his obligations which he assumed at a considerable financial sacrifice, and he now contemplates a return to his own business affairs. He will remain in Washington, however, until a successor is appointed who can take over his work and tend to the completion of the details.

Rumors are current that Mr. Girl is going to be offered a considerably broadened position, with full charge of the co-ordinated truck activities of the Army. It is impossible to say at this time whether Mr. Girl would accept such a position or not.

Baker Gets New Office

General Chauncey B. Baker, who has been holding his rank in the national army and has been in charge of the motors division of the Quartermaster Corps, to-day was appointed colonel in the regular army. It is said this is because Goethals appointed more men than the quota of brigadier-generals allowed.

That the Quartermaster Corps will retain control of the pooled truck activities of the Army is assured by the orders signed last week by Maj.-Gen. P. C. Marsh, acting chief of staff. The orders, which follow, do not state whether the present organization created by Mr. Girl will be retained or whether the standardized truck program will be followed out. The assistant to the quartermaster general, who will be detailed as chief of the motor transport service, has not yet been named. These various details will be announced soon.

The orders which so seriously affect the truck activities, are in two parts. One, a special order, states:

"A board of officers comprising Col. Lucian B. Moody, Ordnance Department; Lieut.-Col. Edwin S. George, Signal Corps; Lieut.-Col. Webster A. Capron, Ordnance Department, N. A.; Major A. Owen Seaman, general staff; Major B. F. Miller, Quartermaster Corps; Major Walter T. Fishleigh, Sanitary Corps, N. A., and Major Lorimer D. Miller, Engineers' Corps, N. A., is appointed to meet at the call of the senior member of the board at such times as may be found necessary and at such places as may afterward be designated to make a study of types of motor vehicles to be used in all branches of the service and to recommend to the chief of staff special designs of adopted types necessitated by the peculiar requirements of the various bureaus with a view to reducing the number of types and securing the maximum interchangeability of parts. Reports will be rendered through the adjutant general of the Army to the chief of staff upon the question of types of motor-driven vehicles to be adopted as standard for use in the Army and such other matters relating to motor-driven vehicles as should be brought to his attention."

It will be seen by this order that although the general staff is in favor of a standardization of motor trucks and motor vehicles, it does not specify the use of the standardized trucks and motorcycle already designed and some of which are in production. Until the new board is completely organized it will be impossible to learn the full meaning of this order.

The general order, organizing the motor transport service, is as follows:

"A motor transport service is hereby organized as part of the Quartermaster Corps. An assistant to the quartermaster general will be detailed as chief of the motor transport service. This officer, under the direction of the quartermaster general, will have technical supervision of the motor transport service and be responsible for its efficiency. He will co-operate with the board of officers appointed by the special order and will be governed by their approved recommendations. The functions of the motor transport service are as follows:

"The purchase and procurement of all motor-propelled vehicles except tanks, caterpillars and other artillery tractors—artillery tractors not to be interpreted as four-wheel-drive or any other type of commercial truck—will be made by or through the Quartermaster Corps, to which will be attached from other bureaus such personnel as may hereafter be found necessary. Inspection of motor-driven vehicles will be made by the motor transport service with the exception or special types required by different bureaus, inspection of which may be carried on under observation of or by the bureau concerned, according to arrangements which may be made with the motor transport service.

"Maintenance and repair of motor vehicles or standard types, also of the approved special designs for different staff departments except tanks, caterpillars and other artillery tractors.

"Technical supervision of all motor-driven vehicles of all the various departments.

"Organization and supply of all motor-driven vehicles except as hereinafter specified. Organization and operation of a department of supplying spare parts of all motor-driven vehicles and supplying gasoline, lubricants and miscellaneous supplies.

"Maintenance and operation of all motor repair shops and garages.

"Maintenance of reserve vehicles for prompt replacement of authorized vehicles lost or destroyed and these turned into repair shops.

"The motor transport service has no responsibility in connection with the operation of authorized motor transport vehicles and units for their assignment by competent orders to units or to other services. All movements of such vehicles, after assignment, are under the control of tactical commanders.

"Purchase of tanks, caterpillars and artillery tractors will be made by the Ordnance Department, which will confer with the chief of the motor transport service in purchasing of such special vehicles in order that the placement of orders will not conflict with orders placed by the quartermaster corps for other vehicles.

"With the exception that this order will not affect any orders or instructions issued by the commanding general, American Expeditionary Forces, all orders contrary to the provisions of this order, are hereby revoked. This order will take affect as soon as the chief of the motor transport service informs the staff departments concerned that the motor transport service is sufficiently organized to take over the work herein prescribed for it."

In addition to these many and very important changes is the vital change in the War Industries Board recently, by which H. L. Horning was made the supervisor of purchases for all automotive products excepting airplanes and whose duties will now include the supervision of purchases as made by this new motor transport service. At this time it is not clear apparently to Washington officials as to just how Mr. Horning will collaborate with this board, but since the requirements division of the War Industries Board represents the last word in purchases it may be assumed that after the problem is straightened out, all orders which will be placed by the chief of the motor transport service will receive their final approval from Mr. Horning.

M. & A. M. HAS WAR COMMITTEE

New York, April 20—At the meeting of the board of directors of the Motor & Accessory Manufacturers' Association held yesterday, a war service committee was appointed to serve as an additional point of contact between the Government and members of the association. A. W. Copeland, president of the Detroit Gear & Machine Co., will be general chairman. The membership of the committee will include the chairmen of the groups of the association as follows: B. F. Tobin, president Continental Motors Corp., chairman of motor and motor parts group; A. R. Domery, vice-president Timken-Detroit Axle Co., chairman of drive group; Christian Girl, chairman of chassis group; J. M. Gunn, president United States Tire Co., chairman tire and tire accessories group; and H. J. Hayes of the Hayes Mfg. Co., chairman of body group.

The question of sanctioning additional accessory shows was brought up at the meeting. The directors decided that this was no time for further expansion, due to the conditions created by the war and that members of the association should conserve rather than expand. It is possible that a tractor show may be sanctioned later, but nothing definite was decided on.

The second annual convention of the credit managers will be at Atlantic City, May 20-21. C. W. Stiger, president, will preside. A preliminary program has been drawn up providing for business session each day, at which the following subjects will be discussed: Trade Acceptances from the Banker's Viewpoint; Trade Acceptances from the Buyer's Viewpoint; Airplane Activities; Trade Conditions of the Present Time; Trade and Economic Conditions After the War; Financing of War Order Production, and Government Disbursements—How to More Readily Collect Accounts.

PLANE PLANT AT MILWAUKEE

Milwaukee, Wis., April 19—Milwaukee manufacturing and business men are sponsors of a campaign to raise funds to move the plant of the Lawson Aircraft Corp. from Green Bay, Wis., to Milwaukee and develop it into one of the largest concerns of this kind. The campaign is based on the condition of actual procurement of Government contracts by the Lawson company. The intention is to place sub-contracts for parts among Milwaukee woodworking plants, the work of assembling, finishing, etc., being done by the Lawson company in a central assembly plant which is to be provided.

COLUMBIA STARTS TRAILER

Detroit, April 19—Columbia Motors Co. started shipment to-day on its first trailer order for the Government. The company expects to bring its output on these vehicles to fifty a day within ten days.

BOLLSTROM MOTORS TO BUILD

Indianapolis, Ind., April 19—The Bollstrom Motors, Inc., which has decided on Marion, Ind., as the location for its new plant, will manufacture four-wheel-drive motor trucks and tractors. The company is planning to construct a plant containing 320,000 sq. ft. of floor space on a site of 10 acres.

S. A. E. HEAD AT JOINT MEETING

Chicago, April 23—C. F. Kettering, president of the Society of Automotive Engineers, addressed the joint meeing of the American Institute of Electrical Engineers, American Society of Mechanical Engineers and Western Society of Engineers last night. Mr. Kettering's subject was "the Automotive Powerplant."

NEW CONTROL FOR SMITH

Chicago, April 23—Boston and New York banking interests have secured the controlling interests in Smith Motor Truck Co., maker of the Smith Form-a-Truck, and plans to finance the company and put it on a sound financial basis have been formulated. According to an official of the concern, no immediate change in the personnel of the company is anticipated.

Iowa and Ohio Buy Fordson Tractors

Basis of Order Same as for Michigan's 1000, $750 f. o. b. Dearborn, Mich.

DEARBORN, Mich., April 22—Iowa and Ohio have each purchased 1000 tractors from Henry Ford & Son on the same basis as Michigan bought its order, $750, f. o. b. Dearborn. This makes five states that have bought tractors from the company. Six thousand have been sent to Great Britain. The Canadian order of 1000 tractors has not yet been filled. The first shipments to Ohio and Iowa left the plant here a few days ago, and it is expected both will be completed almost simultaneously within thirty or forty days. The whole matter relative to the Ohio order was arranged by telephone and confirmed later by letter. The entire country is asking for tractors, according to an official of the company, and it is a question what state will be next to place an order.

Fordson tractors in Ohio will not be handled by agents but only by the Bryant Tractor Co., Columbus, to which application must be made. A practical demonstration of the machine will be given soon on the Ohio state university farm. In a telegram to Governor Cox, Ford said he is making this offer to the Buckeye state because of the interest shown here in the tractor movement. The Governor made this comment on Ford's offer:

"The state government, as already announced, is not interested in pushing any one particular tractor over another, but the message from Mr. Ford is not addressed to me as an individual but to the head of the state government in order that by a definite assurance, both as to price and delivery, tractors can be conveyed to the farming communities of Ohio."

Ford has presented a tractor to a club of Boy Scouts at Washington, who will work many garden plots with it. It is believed that as quickly as one field is worked the boys will send the tractor to another. The company is producing 100 tractors a day and in sixty days expects to double this output.

Air Situation Unclarified

WASHINGTON, April 22—Special telegram—The airplane situation is still a matter of guess work so far as the new administration is concerned. Henry Ford, W. C. Potter, civilian director of aircraft equipment for the Signal Corps, Eugene Meyer, New York banker, Edward R. Stettinius, Second Assistant Secretary of War, and Lieut.-Col. H. H. Byllesby have been named as the possible individuals who may be selected for the position as aircraft administrator. President Wilson still holds the report of the Marshall committee before him and, it is expected, will hold a conference with Secretary of War Baker before making a final decision.

Henry Ford, it is stated, was asked some time ago to devote himself entirely to the aircraft problem, and since the latest German offensive it is said pressure is being brought to bear to induce Mr. Ford to take this work in hand. Senator James E. Watson of Indiana made a thorough investigation of the Nordyke & Marmon factory at Indianapolis last week and declares that the new building erected especially for airplane production is remarkable for its completeness. Senator Watson stated that Nordyke & Marmon originally accepted an order for 2500 Hall-Scott airplane engines which are to be used in training planes. The company finished 1000 of these engines, shipping the last one early in April, when it had to stop this work be cause of the new Liberty engine contracts.

Stopping at this time has been a considerable expense to Nordyke & Marmon, since the cost of tooling and getting into production hardly could be made up on the first 1,000 engines, and new tooling and machining have had to be undertaken for the Liberty engine contract. But the company, because of its intense patriotism, has accepted the War Department recommendation, canceled the remaining Hall-Scott orders and is concentrating on the Liberty engine regardless of cost.

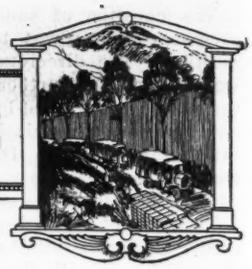
The Senator expressed himself as highly pleased with the complete factory and the tooling and machining and production plans and stated further that he had the highest confidence in the Liberty airplane engine as it will be applied to bombing planes. He described the tests given the Hall-Scott engines as very complete. They were given two separate tests on the block of 4 hr. each, with 20 min. between them, after which they were taken apart and each piece thoroughly examined. Following reassembly they were placed in planes and given a 40-min. flying test. Incidentally Senator Watson declared that Howard Marmon of the company, now an officer of the Army, Dayton, Ohio, told General Pershing many months ago that the first large quantities of Liberty airplanes would not reach France until at least July, 1918. Nordyke & Marmon, when ready for quantity production of Liberty engines, which Senator Watson stated would be very soon, will employ 1000 women and 3000 men.

INCREASE IN TIRE PRICES

Chicago, April 23—Four tire companies, Goodrich, Goodyear, Fisk and Firestone, have increased their prices on pneumatics, solids and all other products 10 per cent. Other concerns, among them Empire, United States and Michelin, expect an increase any day, and the general opinion is that there will be a rise throughout the trade within the next two weeks.

So far the greatest increase is on Firestone non-skid fabric tires, which have advanced from 12 to 15 per cent. The 10 per cent rise of this concern pertains to its cord tires and tubes. Both Firestone and Goodyear announced the price increase to-day, while new prices on Goodrich and Fisks went into effect yesterday. Ajax has made a 10 per cent increase on all products and United States, 10 per cent on all except Nobby.

EDITORIAL PERSPECTIVES



Let the Enemy Build Our Roads

WE now have within our borders hundreds of able-bodied men for whom we are caring, and whom we are feeding, but who are not turning a hand to earn their keep. These are the interned enemy aliens in the concentration camps and prisons. They are a drain on our resources when they should and could be made an asset. In a short time we will have thousands of German prisoners who have been shipped to this country for disposal until after the war. These prisoners, according to newspaper reports, already are beginning to come into the country.

IT is understood that the Inter-Allied War Council is contemplating sending a large percentage of the German prisoners taken, not only by our own men but by our allies, to this country in order that we may keep them. The advantages of this are obvious. Instead of the tons of supplies that now must be sent across the ocean to feed our enemy prisoners, displacing supplies which are badly needed by our own men and our allies, we can utilize the ships which are returning practically empty for carrying the prisoners to our own shores and feed them here.

THE proposal that both interned enemy aliens and prisoners of war in America be utilized for building highways was strongly urged by the United States Good Roads Association at its annual convention in Little Rock last week. This proposal was one of the most important outgrowths of the convention, and one which should have immediate consideration by the powers that be. The employment of enemies, whether they be prisoners or interned aliens, will provide a useful and practical occupation for them, but what is more important, will provide the labor necessary for meeting the immediate needs of highway improvement, which is a wartime necessity, and will not cause any drain on our free labor, which should be devoted to war supplies.

NOT only will it provide the necessary labor but to a great extent it will overcome the one great objection to wartime road building, that of the transportation of road materials over our already over-burdened railroads. In practically every locality, road material of more or less value is present, and if this labor can be used in developing the local road material resoruces, we can get the road work done without calling on the railroads. The very necessity which makes unlimited shipment of road materials on our railroad inadvisable at present makes the need for improved highways the more imperative. By using these incumbrances, such as the interned enemy aliens and the prisoners of war will be if they are not employed in some useful occupation, we shall develop a badly needed resource which will aid us in the prosecution of the war.

Do Your Tractor Shopping Early

WE have the word of leading manufacturers of tractors to the effect that it will be exceedingly difficult for tractor manufacturers to produce the quota of machines expected from them for the present year. The supply of raw materials is limited; considerable delay is being experienced in procuring completely assembled accessory parts; new machines ordered for the increase of productive facilities are being delayed in delivery and still more transportation difficulties impend. Manufacturers of tractors are urging dealers to file specifications now for fall deliveries if they have any expectation of getting the tractors they will need. They advise them to make certain now that fall trade needs shall be supplied.

TOO many dealers are prone to ignore trade warnings of this kind, basing their indifference upon the fact that many times in the past when they have heard similar things the results in the end have not justified the early apprehensions. However, conditions are different now, and no one may say just how much more serious they may become. The safe thing to do then is to take no chances.

What the Industry is Doing

IT is too bad that every American citizen who under-appreciates the great motor car industry, the third industry of the country, could not have attended the Fifth National Foreign Trade Convenion at Cincinnati last week. For there the importance of the motor car in trade was presented by men who could offer specific instances to substantiate their statements and whose words, as a result, were of much weight. John N. Willys brought out the idea that there is no one industry in this country which can be considered of greater importance than the motor car indusry with its giant capacity for production. It has supplied the motor transport trucks, officers' cars, ambulances, tractors for guns, tanks, special vehicles for airplane and balloon service, motor kitchens, traveling shoe repair shops dental trucks and many others. In addition it has placed itself under contract to make many kinds of other military supplies, including airplane engines and parts, submarine chasers, marine bomb anchors, gun recoil checks, artillery wheels, shells for the guns and many other products before foreign to the industry.

THE industry is handling $600,000,000 worth of war contracts. One reason for this is the ability of modern motor car plants, with their well-equipped plants and thousands of expert workers, to handle such contracts. Motor car engineers designed the Liberty trucks and the Liberty airplane engine. Motor car engineers are in charge of truck and airplane production for the Government. Besides, the industry in this country has had to handle the greater part of the motor car and truck needs of the Allied countries. When the motor car factories of England and France were taken over for the manufacture of munitions, these countries and all the neutral countries necessarily turned to the United States for motor cars and trucks Maintenance of a supply of motor vehicles for use in the United States is of secondary importance only to work the industries has undertaken for war-ridden Europe.

"Don't Walk to Berlin—Ride with the Tanks"

NEW YORK, April 19—"Don't Walk to Berlin—Ride with the Tanks" is the slogan of a country-wide drive just inaugurated to select 2000 men for the United States Tank Corps. Men accepted into the Tanks Corps have an unusual opportunity to see active service more quickly than in any other branch of the service. Men recruited into the service in January already are seeing actual service overseas.

All the men taken into the Tank Corps enter as privates and are rated according to their demonstrated ability after a short period of intensive training at the tank camp in Gettysburg, Pa. There is a greater percentage of non-commissioned officers in the Tank Corps than in any other branch of the service.

All men from eighteen to forty-five years of age are eligible. It is possible that men of unusual qualifications who are accepted for the Tank Corps and who are within the draft age may obtain permission to enter the tank service. Men of the following classifications are sought: Tractor drivers, motor truck drivers, motorcycle drivers, motor car mechanics, ignition experts, blacksmiths, acetylene welders, bench machinists, lathe hands, telegraph or radio operators, cooks, storekeepers, stenographers or typists. In addition to men of these trades, many men of mechanical trend are required as machine gun mechanics and operators.

As soon as the present allotment of 2000 men has been filled by recruiting, it is expected that a new authorization for as many more will have been sent out from Washington. All applicants seeking further information should apply to the officers designated below at the U. S. Army recruiting stations in the cities named: Capt. Roderick Stephens, New York; Lieut. G. G. Garland, Chicago; Lieut. Chester L. Lewellen, Detroit; Lieut. James A. Colvin, St. Paul, Minn.; Lieut. Thomas W. Crosby, Boston, Mass.; Lieut. Frank E. Cooter, Kansas City, Mo.; Lieut. Worth C. Peacock, Birmingham, Ala.; Lieut. Edward L. Kinder, Philadelphia, Pa.

TO DISCUSS WAR BUSINESS

Detroit, April 19—An added feature of the Third Annual Session of the World's Salesmanship Congress that meets in Detroit April 24-27 will be a talk by J. B. Clarkson, managing director of J. B. Clarkson, Ltd., New Zealand, whose topic will be "How Business Can Profitably and Patriotically Carry On During Wartimes." Mr. Clarkson is well known in the industry as a jobber of automotive vehicles. His own plant has been increased by $250,000 worth of new structures and he maintains that this is a time to build, that materials will cost more next year and increase in subsequent years.

What England is doing will be heard from Herbert N. Casson. He is an American and went to England five years ago to show business men of that country the way out of their industrial problems. His topic at the congress will be "How the United States Can Do It."

Norval A. Hawkins, general manager of the Ford Motor Co., will talk on the "Citadels of Cash, Credit and Commerce." E. LeRoy Pelletier's subject will be "Practical Patriotism." The foregoing talks will all be given as part of the first day's session. Roger W. Babson, the statistician, will give a talk on "The Employer's Mistake."

Where the past sessions of the congress dealt primarily with the technicalities of salesmanship the coming session will take on a different atmosphere. Salesmanship is a secondary consideration at this time. The status of business during war will be the main theme throughout the session.

COST OF RURAL EXPRESS

Washington, April 19—The Committee on the Postoffice and Post Roads of the House of Representatives has compiled the following figures in reference to the cost of operating rural express service in the United States:

½-Ton Truck

12 m.p.g. of gasoline, 2609 gal. at 25 cents	$ 652.00
31,300 miles on tires, at 1½ cents per mile	465.50
31,300 miles—repairs, at 1 cent per mile	313.00
Oil, grease and incidentals, at ¼ cent a mile	78.00
Garage rental, at $7 a month	84.00
Depreciation, 25 cent	114.00
Interest on investment	22.50
Total	$1,729.00
Salary of driver	1,200.00
	$2,929.00

$1,000,000 for Army Road

NEW YORK, April 19—One million dollars has been provided for the maintenance of the main Army motor truck road between Buffalo and New York in a bill presented in the New York legislature by Senator Sage, which has passed both houses and now awaits the signature of Governor Whitman. Opinion in Albany is that the bill will become a law before the end of the 30-day period which the governor is allowed for all measures not signed before the closing of the legislature which occurred on Saturday, April 13.

With this appropriation New York will spend more money for road maintenance in 1918 than in 1917, even although less money has been appropriated for general road maintenance this year. In 1917 $4,500,000 was appropriated for general maintenance while for this year the appropriation is only $3,750,000. To this must be added the $1,000,000 which undoubtedly will be appropriated for the military highway, thus making a total appropriation of $4,750,000, or $250,000 more than the total of 1917.

10 m.p.g. of gasoline, 3130 gal. at 25 cents	$ 782.50
31,300 miles on tires, at 1½ cents per mile	468.50
31,300 miles—repairs, at 1 cent per mile	313.00
Oil, grease and incidentals, at ¼ cent per mile	78.00
Garage rental, at $7 per month	84.00
Depreciation, 25 per cent	465.00
Interest on investment	93.00
Total	$2,284.00
Salary of driver	1,200.00
	$3,484.00
Per day	$11.13
Per mile	.11
Per pound, based on 1 ton per day	.0055

Depreciation, 25 per cent. Actual use of car, three years, and sale or exchange value at end of that period.

Note all estimates are maximum costs, at present high prices for labor and equipment, although it is believed that a ½-ton car will be utilized in a majority of instances, as it will transport not more than approximately ½-ton each way, while being capable of overload capacity, if necessary, in emergency.

To carry ½-ton each way, as contemplated, on a 50-mile route, out and return, the cost would be	$1,765
Plus labor	1,200
Total	$2,965

Or $9.46 per day, or $0.095 per mile, or 0.0047 cent per pound.

INDUSTRIAL MOTOR SHOW

Oakland, Cal., April 17—A pavilion with 10,000 sq. ft. of floor space and capacity for 1000 machines will be provided for the motor show which is to be held in connection with the Pacific Coast Land and Industrial Exposition Sept. 9-Oct. 6. An arrangement of tiers will make each exhibit of machines clearly visible.

The exposition occupies more than 30 acres of ground as well as the civic auditorium and will exploit the land and industries of the West. Among the features will be motor cars and tractors.

HIGHWAY MEETING CALLED

Chicago, April 22—The Illinois Highway Improvement Association will meet at Monmouth May 9, at which time fifteen counties organized in support of the proposed $60,000,000 good roads bond issue will be represented. Invitations to attend have been extended to Governor Frank O. Lowden and Former Governor Edward F. Dunne of Illinois and to Governor W. L. Harding of Iowa.

"BEG PARDON!"

In the caption of an illustration in the article on "Teaching Ordnance Motors" in the issue of last week it was stated that the school at Kenosha teaches the F-W-D truck. As Kenosha is the home of the Nash Quad and one of the Ordnance Motor Section Instruction Schools is located there, the caption should have stated that the school teaches the Nash Quad. The F-W-D acts as the textbook at Clintonville, Wis., and Racine, Wis., the Racine school being the Mitchell factory.

Miss P. Marcus, whose photograph appeared in last week's issue, sells ball joints for W. S. Porter & Co., not oil as stated.

No Gas Shortage Near

Requa Denies Danger of Cutting Off Supplies to Passenger Vehicles

Situation Much Different from That in England

WASHINGTON, April 20—There is no immediate danger of gasoline shortage in the United States. Mark L. Requa, director of the oil division, U. S. Fuel Administration, is responsible for this statement. Mr. Requa states:

"There has been considerable discussion as to cutting off the supply of gasoline to passenger vehicles following the precedent set in England, but the conditions are entirely dissimilar for the reason that England produces no oil and relies entirely upon exports overseas. The United States, on the contrary, not only produces the oil for its own consumption but large surplus quantities for export. It is quite obvious that the oil facilities of the United States must be used in such a way as to produce the maximum benefit viewed from a national standpoint to meet the existing crisis."

"Total stocks in the United States approximate 160,000,000 bbls. as of January 1. Last year's production approximated 320,000,000 bbls. and there was a draft on stock of 20,000,000 bbl. There is ample oil territory available in various parts of the United States. It is only a question of drilling to secure it."

The only difficulty in the oil situation is in lack of transportation facilities. Gasoline as a by-product of fuel oil used in the navy, in industry and other important military activities will continue to be produced in greater quantities than ever. Crude oils are dangerous for fuel use so long as they contain gasoline. Consequently until the gasoline is removed fuel oil cannot be used. Obviously, unless the gasoline produced is sold and used there will be an inclination on the part of producers to curtail production of fuel oil with an increase in its price. For this reason the Fuel Administration encourages the consumption of gasoline in motor vehicles.

GEAR MAKERS MEET

White Sulphur Springs, W. Va., April 20—Standardization of gear design and of commercial methods in connection with the manufacture of gears was the chief topic of discussion at the annual meeting of the American Gear Manufacturers' Association, which came to a close at the Greenbrier Hotel here to-day after a run of three days. A report dealing with the advantages of standardization and its possibilities in the gear manufacturing industry was presented by the standardization committee, of which B. F. Waterman of the Brown & Sharpe Mfg. Co., Providence, R. I., is chairman.

Three papers were read, "Hardening and Heat Treating of Gears," by C. R. Poole of the Frost Gear & Forge Co., "Uniform Cost Accounting," by J. H. Dunn, auditor of the R. D. Muffall Co., and "Hobs and Hobbing Machines," by Mr. Edwards of the Barber-Coleman Co. John H. Willys spoke at the banquet. Government industrial relations and the work of engineering and commercial standardization accomplished by the Electric Power Club was considered by S. L. Nicholson, assistant to the vice-president of the Westinghouse Electric & Mfg. Co.

The association, which was organized at Lakewood, N. J., March 26, 1917, with a charter membership of nine concerns on its list, now has a membership of forty-one concerns, including all the important firms in the industry. All the old officers were re-elected: F. W. Sinram, Van Dorn & Dutton Co., Cleveland, Ohio, chairman; Henry E. Eberhart, Newark Gear Cutting Machine Co., vice-chairman; Frank D. Hamlin, Earl Gear & Machine Co., secretary; and Frank Horsburgh, Horsburgh & Scott Co., treasurer. Mr. Horsburgh declined re-election and Mr. Hamlin will act as secretary-treasurer.

Detroit Production Off

Materials and Labor Shortage Reduce Motor Car Output 20 Per Cent

DETROIT, April 19—Inability to get a sufficient supply of materials and the shortage of labor have reduced by 20 per cent the production of many of the motor car manufacturers in this territory. The demands on materials by the Government have made it impossible for the parts manufacturers to maintain their production to supply the requirements of the motor car manufacturers. These shortages are felt in several different components. The lack of one kind of parts will retard the entire production.

Industries report a shortage of labor varying from 100 men to 5000. Reo needs 500 skilled mechanics, Willys-Overland 1000; Timken-Detroit Axle could use several hundred, and the need of men is expressed from nearly all factories. The Kelsey Wheel Co. to meet the need of help is introducing women; 200 are now in active employment at this plant, and the company can use 1000 more men.

The shortage of freight equipment has had much influence in decreasing production of many of the plants, for it has prevented them from obtaining much of the required material. The incoming freight transportation is a limiting factor in the production schedules.

A relief of outgoing freight has been felt during the last few weeks. The industries report that they have been able to get many more empties than was possible for some time. The manufacturers who have been receiving machinery for Government work availed themselves of the freight equipment thus brought to their doors and used it for their outgoing shipments. Several manufacturers, however, state they are having difficulty with freight shipments and have very little trouble in getting the labor they need. But of these there are comparatively few.

To Cut Rubber Import

Curtailment Will Affect Motor Car Tire Business to a Large Degree

Makers May Have to Produce Inferior Goods

WASHINGTON, April 19—Imports of raw rubber to this country will be curtailed by an order of the War Trade Board, which will be issued soon. The order also will curtail import of other articles and will be known as the second import embargo list. It is designed to create more available shipping tonnage for traffic between this country and France.

The curtailment of the rubber import will be the most important action of the new order and will affect to a considerable degree the motor car tire business. Imports of rubber for the last five years have increased 400 per cent and an immense shipping tonnage is now devoted to this business. Inasmuch as the motor car industry has agreed to a 30 per cent curtailment of passenger car manufacture it is anticipated that the curtailment of rubber import for tire manufacture will be somewhere in the neighborhood of this figure. It is understood that the order will refuse licenses to importers of the better grades of rubber from Java and eastern points. Rubber imports from South America will be continued, but these will be insufficient and it is anticipated that after the large reserve rubber stocks in this country are exhausted American tire makers will be forced to produce tires of material less durable.

The Shipping Board, following its conference with importers of rubber, yesterday arrived at prospective terms which were not made public and which will be discussed in conference with the War Industries Board. After the final agreement is reached it will be turned over to the War Trade Board for ratification and announcement.

RUBBER IMPORTS INCREASED

New York, April 19—More rubber arrived in the United States during the first three months of 1918 than in the same period of 1917; the exact increase was 4779 tons. There have been some difficulties with transportation, however, which may have caused the circulation of rumors, not based on fact, that there exists a shortage of rubber.

During the first three months of 1917, imports of rubber totaled 41,574 tons as against 46,453 tons for the first three months of 1918. January and February both show substantial increases over the same months last year, though imports fell off slightly in March. Following are the statistics, as compiled by the Rubber Association of America:

MONTH	1917 TONS	1918 TONS
January	12,788	16,084
February	10,162	13,108
March	18,624	17,161
Total	41,574	46,353

During the entire year of 1917 a total of 167,062 tons of rubber was imported. This represents an increase of 43 per cent over the importations for the year 1916.

Although plenty of rubber is coming into the country, its transportation in the United States is causing slight worry. Most of the Akron rubber mills, for example, receive their shipments of rubber at a Pacific Coast port of entry. This means shipment across the continent by freight, and it is here that the delay occurs. It is stated that it is not uncommon for shipmens to be enroute for two or three months, and in one case a shipment which left the Pacific coast last November has not yet reached its destination. It is hoped that some of the transportation troubles will be smoothed away with the coming of better weather.

CHEVROLET TO TARRYTOWN

New York, April 22—The Chevrolet Motor Co. will move its manufacturing, sales and accounting activities to the company's factory, at Tarrytown, which will absorb all the factory work of the Eastern territory. Freight difficulties have made this necessary. Local service will continue to be given in New York, and the Chevrolet salesroom also will be continued.

RETURN LOADS BODY FORMED

Providence, R. I., April 19—One of the biggest steps yet taken in the development of return loads bureaus in the United States was made here yesterday when the New England Highways Return Loads Association was formed. That organization will establish return loads bureaus throughout all New England but more particularly at the present time Rhode Island and Massachusetts. Connecticut already has a very efficient Return Loads Bureau organization in operation, and the various bureaus in Connecticut will co-operate with those to be established in Massachusetts and Rhode Island to the end that the entire New England district will be served by its motor trucking equipment to the best possible advantage during the summer of 1918, this fall, and in the spring of 1919. Officers of the new association were elected, as well as an executive committee of six made up of two members each from Connecticut, Massachusetts and Rhode Island. The working organization is now being planned and letters being prepared to be sent out to shippers and truckmen for the necessary information.

GASOLINE CLIMBING AGAIN

Chicago, April 20—The price of gasoline in this territory was raised this week for the first time in six months. The Standard Oil Co. of Indiana announced an increase of 1½ cents a gallon in the tank wagon price, making it now 22½ cents. The filling stations, both the Standard and the Independent, have raised their prices from the previous figure of 21 cents to 24½ cents. The reason given by the Standard Oil Co. of Indiana is the heavy Government demand, particularly for the high-grade fuel needed for aviation engines, which puts a greater strain on the refiner. It is impossible to get an expression as to whether it anticipates any raises in the near future.

U.S. Takes Over Bosch

Investigation Shows Company to Be Owned Throughout by Germans

Entire Product to Be Placed at Military Disposal

WASHINGTON, April 19—The Government through the Alien Property Custodian has taken over the plants of the Bosch Magneto Co. at Springfield, Mass., and Plainfield, N. J., as the result of an investigation which showed the company to be owned entirely by Germans. Directors will be named by the custodian, and the business will be continued, but the entire product is to be placed at the disposal of the munitions committees.

The official announcement by the Alien Property Custodian is as follows:

"Prior to the entrance of the United States into the war this company refused to take orders from the Allies, and after the United States went in, it was loath o render any service to the Government in its activities against the fatherland.

"The directors to be appointed by the Alien Property Custodian will immediately take charge of the works. They will be operated in full by the United States and the entire product be placed at the disposal of the Munitions Committees. As this is one of the best equipped plants in the country its output will be of inestimable value to both the Army and Navy.

"After the examination conducted by Francis P. Garvin, director of the Bureau of Investigation, an examination which is tracing the ownership of many properties in various parts of the country, all the capital stock of the Bosch Magneto Co. has been proven to be owned by Robert Bosch and other residents of Germany. When first reported by Carl L. Schurz of New York as president in December, 1917, he claimed that all but a small proportion was owned by residents of this country. At the time of the declaration of war Otto Heins, who was then president, and many of the German heads of departments walked out of the mill with the purpose that this concern should not be used in making war upon Germany. The present directors are Carl Schurz and Gustav Jahn. These directors will be replaced by directors to be designated by the Alien Property Custodian."

TRACTOR DRIVERS RECRUITED

Columbus, Ohio, April 20—William B. Goodwin, representing the War Department, is recruiting tractor drivers for foreign service. He has opened headquarters in room 309 Hartman building, where he is receiving applications. While many truck drivers apply for enlistment, comparatively few tractor drivers apply. The tractors will be used in moving ammunition and artillery.

CRUDE OIL OUTPUT INCREASES

Washington, April 19—Production of crude oil during March was 176,000 bbl., more than twice as much as in February. This was also an increase of 50,000 bbl. over March, 1917, and 20,000 over March, 1916. The number of completed wells for March this year was 1962 as compared with 1200 in February.

A. A. A. SANCTIONS RACES

New York, April 19—The Contest Board of the American Automobile Association has sanctioned several speedway events for 1918. The following schedule has been decided on definitely:

May 16	Uniontown
May 30	Sheepshead Bay
June 22	Chicago
July 4	Cincinnati

INDEPENDENT TRUCK BUYS PLANT

Youngstown, Ohio, April 20—The Independent Motor Co. has been incorporated here for $30,000 and expects to be under production within ninety days in the plant of the Miller-Smythe Electric Co., which it has purchased. Contracts have been placed for 300 trucks the first year. A. W. Frantz, vice-president and general manager, formerly was president and general manager of the Independent Motors Co., whose assets and business have been taken over by the new company. The first year's production will be confined to 1 or 2-ton worm-drive trucks, though it is planned to add larger trucks to the line later.

ORDNANCE PLACES MORE ORDERS

Washington, April 19—The Ordnance Department placed the following contracts recently: Ohio Trailer Co., Cleveland, Ohio, 10-ton experimental trailers; Holt Mfg. Co., Peoria, Ill., caterpillar tractors 45 hp.; Quartermaster Depot, Chicago, Indian motorcycles with sidecars.

President Wilson riding about the White House grounds in the tank Britannia

French Engineers' War Congress

Plans for Post-War Activities and Recommended 492-ft. Tunnel for Aviation Tests

By W. F. Bradley

Motor Age Special Correspondent in France

PARIS, March 20—The French Congress of Civil Engineers, which was inaugurated in Paris this week in the presence of President Poincairé, is one of the several important and visible indications that the French nation is seriously tackling the problems of industrial regeneration and commercial competition after the war. Other indications are to be found in the Lyons trade fair, bigger and more important than ever; in the Paris trade fair, preparation for which now are being made, and, to those who have an opportunity of looking behind the scenes, in the plans laid and in the preliminary work carried out by all the big industrial organizations of the country. During 1915, 1916 and 1917 France had no thought and no spare energies for anything but the war. With 1918 she continues the war without any abatement, but at the same time is laying plans for the industrial struggle bound to come with the return of peace.

The Congress of Civil Engineers includes an important section devoted to automotive industries—the commercial motor car, farm tractors, motor boats, airplanes—but is not by any means limited to these industries. It has united all the big industrial organizations of the country, including practically all the leading mechanical and electrical engineering establishments of France and has as its president M. Millerand, a former minister of public works and of war.

Support of Government

The most prominent note struck by M. Clementel, French minister of public works, at the inauguration of the Congress was that the French government has decided to give its full support to schemes of standardization in ship-building, in railroad construction and in the specifications of metals used on government contracts. The various government departments are following closely the work of the congress, and arrangements have been made whereby all the decisions arrived at shall be transmitted to a legislative section of the congress, which will be entrusted with the task of preparing them in the form of proposed laws or decrees ready for presentation to parliament. In this way there is every possibility of the work of the congress resulting in more than platonic votes.

From the standpoint of the automotive industries the most important report presented to the congress was that of G. Lumet, chief engineer of the Automobile Club of France laboratory and the officer sent to America in 1914 to make the first purchases of motor trucks for the French army. Mr. Lumet dealt with the situation of the motor car industry after the war and laid particular stress on the necessity for standardization, particularly with regard to metals. There is in France no organization corresponding to the S. A. E. in America. Nevertheless, the work of the American society is well known in France and engineers are far from being in ignorance of the advantages obtained by standardization.

It is rather peculiar that the first definite proposal in favor of the standardization of motor car steels should come from the Paris General Omnibus Co., which until the war was not a motor car manufacturing concern at all. This company is of the opinion that for heavy vehicles at least the specifications of steels used in the motor car industry could be reduced to five or six. No decision was taken on this point, the matter being referred to the standardization section, which is handling the general problem of standardization of metals throughout the engineering industry.

Dealing with accessories, Mr. Lumet pointed out that the army is strongly in favor of standardization of such things as screw threads, gasoline pipes, caps for gasoline tanks and radiators, plugs in base chamber, gearboxes, differential housings, etc. Already magneto bases and couplings have been standardized throughout the French motor car and aviation services. The same has been done for drive chains, and a year ago standardization was decided on for solid tires and rims.

Other questions brought up in this report were maximum axle loads and technical education.

With regard to economic conditions, Mr. Lumet brought forward the conclusions arrived at by the French Chambre Syndicale of motor car manufacturers, a body under the presidency of Louis Renault, uniting about 85 per cent of the motor car manufacturers of France. This organization is of the opinion that foreign motor cars now owned by the war department should not be thrown on the market at the end of the war but should be retained by the military authorities until unfit for further service. They also propose that the pre-war import duties, based on weight but practically equivalent to 8 per cent of the value, should be abolished in favor of a 70 per cent ad valorem duty for the first twelve months after the war, 40 per cent for the second year and 20 to 30 per cent from the twenty-fifth and following months after the war. These proposals have been submitted by the French motor car manufacturers to the minister of finance but were not voted on by the congress.

Mr. Lumet also presented a report on the development of the use of internal combustion engines in the merchant marine. In 1914, just before the outbreak of war, the naval department organized an exhibition at Boulogne, together with a competition for French engines for fishing boats, it being the intention to subsidize these motor boats in the same way as has been done for several years for motor trucks.

The marine internal combustion engine has received very little attention in France. A law passed in 1906 offered a subsidy to motor boats and ships on condition that both hull and machinery are of French construction. France did not possess Diesel and similar engines, and there was no encouragement to fit foreign engines, for if this was done the subsidy was lost for the entire ship. The war showed this situation to be so disadvantageous to French interests that in 1916 an exception was made whereby all vessels put under construction not later than eight months before the cessation of hostilities should be entitled to the subsidy on the hull even if the machinery were of foreign construction.

The congress voted that this exception be allowed to remain in force for three years following the end of hostilities, thus encouraging ship owners to use foreign internal combustion motors while the French industry is preparing to meet the new demand.

The inequality resulting from the law which allowed coal to be brought into ports under the duty of only 24 cents a ton while oil for Diesel engines was taxed $18 a ton was pointed out and a resolution passed in favor of the creation of heavy oil depots in all ports with duties no higher than those levied on coal.

Aviation After the War

In the aviation section Lieut.-Col. G. Espitallier dealt with the possibilities of aviation after the war, with the conclusions that the ministry of the colonies should organize an aerial geographical and protographic section and that a regular aerial post should be established over all the colonial routes at present covered by caravans only. It also was voted that the postal service undertake the organization of mail and parcel post over the important routes of France, as well as between France and Corsica, Algeria and England. Also that regular passenger services be organized as soon as the essential conditions of security have been obtained.

The congress being of the opinion that aerial services could not succeed unless there was some guarantee against competition, it was voted that aerial police regulations should be drawn up and that companies starting a public service should be given a limited concession under a government technical and commercial control.

All present airplanes having been built for war conditions, and in consequence being unsuitable for commercial service, it was voted that manufacturers be asked to study big-load capacity and high-powered airplanes suitable for after-war conditions.

Colonel Roche pointed out that no college course now exists for the formation of technical staffs in the airplane industry. He outlined the course of instruction most suitable for the formation of aviation engineers and concluded with a proposal, voted by the congress, that both the state and

manufacturers should encourage every serious organization created with the object of training aviation engineers. R. Soreau presented a strong case in favor of the building of a low pressure and low temperature laboratory-tunnel in which to test airplane engines. It was claimed that although inferior in general construction, German airplanes had a higher ceiling than similar French planes on account of greater attention being paid to the suitability of the engine for operating at high altitudes. The Germans have two low-pressure and low-temperature laboratories, while the allies have none.

The proposed scheme is for the construction in France of a $300,000 laboratory-tunnel in which engines could be tested under exactly the same atmospheric conditions as are found at high altitudes. The proposed laboratory consists of a tunnel in armored concrete 492 ft. long, having two concentric chambers, the inner one with a diameter of 16.4 ft. and the outer one a diameter of 24.6 ft. The object of the outer cylinder is to provide a return passage for the cold air of the central chamber, thus increasing the length of time during which this air could be cooled.

Capacity of Laboratory

Such a laboratory would receive engines up to 500 hp. mounted in their own fuselage and driving their own propeller. The temperature could be reduced to 35 deg. Cent. and maintained at this low figure for 20 to 25 min.; the degree of dampness could be varied at will, and ice, hail, icicles, snow and brusque variations of temperature obtained, thus getting all the varied atmospheric conditions to be found at high latitudes. It was pointed out that for lack of such a laboratory it frequently happened that a full year elapsed between the successful passing of bench tests by a new engine and the complete tuning up of that engine on an airplane. So little scientific data was available regarding conditions at high altitudes that the tuning up on the plane was no better than tinkering.

The motor car industry, and indeed the whole industrial organization of France, is so bound up with touring that there was no hesitation in devoting one branch of the civil engineers' congress to touring and hotel industries. The government showed its interest in this by founding, in 1910, a national touring office, the object of which was to co-ordinate the work done by such private organizations as the Touring Club of France, the Automobile Club of France, the Alpine Club, etc., and to carry out propaganda work in foreign countries more influentially than could be done by any private organization.

In one of the two reports presented, Baudry de Saunier and Auscher pointed out that the mountains, rivers, roads, picturesque sites and fine architecture of France are a national asset which should be cultivated. In 1913, 1,100,000 people visited Mont Blanc; supposing that each of these persons spent $10—which is a very meager estimate—the turnover for Mont Blanc was thus $11,000,000, most of it being money brought into France from abroad. Mont Blanc and the other natural wonders of France cost the country nothing. The Eiffel tower, erected as an attraction, cost $2,000,000.

It is recognized that if the natural beauties of France are to be exploited there must be good hotels. The fact is not disguised that at the present time France provides good food and excellent cooking everywhere but is lacking in well-kept, medium-class hotels. Unless these hotels are built, the natural beauties of the country will inevitably remain unexploited. To meet the shortage the national touring office, working in conjunction with the touring Club of France, has brought about a union of all hotel interests and has succeeded in inducing a group of banks to advance capital to hotel proprietors or to approved persons about to establish hotels. In addition the Touring Club of France has established fourteen schools for the training of hotel proprietors and staffs.

Taking full account of the shortage of tonnage which will exist after the war, it is estimated that 3,000,000 tourists will visit France during the three years following the declaration of peace. The average length of stay will be thirty days, and the daily expenditure will be not less than $20 per day, which means that $1,800,000,000 will be brought into France within three years of the end of the war.

The government has decided that the battlefields of France shall be thrown open to the visitor at the earliest possible moment, and toward this end the national touring office has worked in conjunction with the transportation companies to plan touring routes into the army zones and surrounding districts. In direct competition to the German Baedeker, the Michelin Tire Co. has started the publication of a very valuable series of guides to the battlefields of France. The first volume of this already has appeared.

Col. George Pope

HARTFORD, Conn., April 20—Col. George Pope, president of the National Association of Manufacturers, treasurer of the National Automobile Chamber of Commerce, and formerly treasurer of the Pope Mfg. Co. of Hartford, died at his home here yesterday. Colonel Pope has been connected with the Pope Mfg. Co. in various capacities since 1890, when he became president of the Hartford Cycle Co., a branch of the Pope Cycle Co. founded by his cousin, the late Col. Albert A. Pope. In 1899, when many bicycle interests were merged into the American Bicycle Co., he was elected vice-president of the concern and later president of the reorganized Pope Mfg. Co.

Colonel Pope's first active interest in motor cars was in 1897, when his company put on the market several Columbia electric phaetons. He was at one time chairman of the show committee of the Association of Licensed Automobile Manufacturers and the Automobile Board of Trade. It was largely through his efforts that the early motor car shows were successful, and he had active charge of the work in the New York shows from 1903 to 1913. When the Electric Vehicle Manufacturers' Association was formed in February, 1906, he was elected president.

Colonel Pope was seventy-four years old. In 1862 he enlisted in a Massachusetts regiment for the Civil War and served until August, 1865, when he was honorably discharged with the rank of lieutenant-colonel of the 54th Massachusetts regiment.

U. S. TIRE SALES $55,000,000

New York, April 19—Tire sales by the United States Rubber Co. during 1917 were more than $55,000,000, as compared with slightly less than $40,000,000 in 1916. For the first three months of this year the company showed a gain of 40 per cent in sales over the corresponding period of 1917. Total sales in 1917 amounted to $176,159,694, of which $31,243,053 was operating profit and $15,340,577 surplus applicable to dividends.

REPUBLIC TRUCK DOUBLES OUTPUT

Alma, Mich., April 20—During the nine months ending April 1, 1918, 11,400 Republic trucks were built and delivered, as compared to 5900 in the same period prior to April 1, 1917. Cash receipts for the nine months ending April 1, 1918, were $12,000,000 as compared with about $6,000,000 in the same period of the preceding year. The schedule of production at present is sixty trucks a day, or about 2000 a month.

REO TRUCK OUTPUT INCREASES

Lansing, April 20—Truck production of the Reo Motor Car Co. for the month of March was 735 compared with 325 in March 1917. The present output of fifty per day will be increased. April 15 the sales department was 1119 trucks behind its orders, of which 270 are heavy-duty trucks.

PLANES FROM VICTOR COMPANY

Washington, April 20—The Victor Talking Machine Co., Camden, N. J., has received a navy contract for thousands of hydroplanes running into millions of dollars. Production by June 1 is expected to be two a day. Five thousand employees will engage in the work.

United States Good Roads Association Urges

National Highway Program

Resolution Addressed to President Wilson and Congress Calls for Federal Commission to Look After Road Construction Under Way

By Darwin S. Hatch

Editor Motor Age

LITTLE Rock, Ark., April 18—Immediate need of the adoption and carrying forward of a definite and complete program for the construction of national highways by the national Government is the burden of the message which goes out to America to-day from the Sixth Annual Convention of the United States Good Roads Association which was in session here Monday, Tuesday and Wednesday of this week. The result of the whole meeting is embodied in a resolution addressed to Congress and President Wilson calling for the creation of a Federal highway commission which will look after the roads now under construction. It suggests that these roads should be designated as parts of a comprehensive Federal highway system. Particular pressure is laid upon the need of an immediate action with reference to roads connecting military cantonments and other points with their bases of supplies and also special reference was made to such roads as give communication to military and naval points along our sea coast, as a matter of national defense.

To Present Resolutions

This resolution is to be presented to Congress and the President by special committee of the association, headed by Senator Bankhead of Alabama, the father of the Bankhead-Shackelford Federal Aid law. The convention went on record by means of further resoluti ns as favoring the utilization of interned alien enemies and prisoners of war in road construction. This proposition was the subject of a great deal of discussion on the part of the delegates, all of which was favorable. It was brought out that we now have a very large number of interned alien enemies, most of them being held in concentration camps in the South, that they were being cared for but were not doing any real productive work, also that the first of the German prisoners from the west front were beginning to come over and soon there will be thousands in this country which would have to be taken care of. The discussion of the resolution suggested that inasmuch as America has to send supplies to Europe to feed enemy prisoners that it would save much tonnage if as many as possible were brought over here when our boats returned practically empty so that they could be supplied here without shipping food for them to the other side.

It is understood that such a move is now in contemplation by the United States and its Allies and the use of a large proportion of such prisoners upon road building in this country would permit a much-needed development and conserve our own manpower for other uses.

Another resolution of the association developed from the fact that in some states road work was made much more expensive because, due to an executive order by Ex-President Roosevelt, the use of convicts on National Reservation is not permitted. This made the cost of construction of roads in some of our western states where convict labor was used almost prohibitive on such sections as passed through National Reservations. The resolution therefore urged that President Wilson rescind this executive order during the period of the war.

The United States Good Roads Association went on record also as favoring strongly the use of the patrol system in road maintenance, so that roads could be kept up to their proper condition at all times and the expense of maintenance be decreased.

Recognition of the value of tourists' camping sites was given in a resolution urging good roads organizations, chambers of commerce, and motor clubs to establish such camping sites where practicable. The convention went on record also as advocating the abolishment of advertising signs on telephone poles, trees and rocks where they deface the beauty of the scenery.

The need of some standardized system of traffic rules and signals developed a resolution urging upon state legislatures and municipal bodies the adoption nationally of some one standard law for states and cities, so that motorists would not unwittingly disobey the law in every city they passed through, on account of the recent confused status of the traffic regulations.

The present most unsatisfactory status of the road building situation due to the impossibility of determining what roads may or may not be considered as economic or military necessities is so seriously holding up the prosecution of even necessary road work, some times where the construction has been completely financed and everything ready to go ahead, that the association by a resolution asked for an immediate definition by the War Department, the Federal Reserve Board or the Office of Public Roads of the terms "military and economic necessities" as applied to highways.

The issuance of bonds and letting of contracts for road work it was found has been seriously held up because of the red tape necessary for the approval of the Federal Reserve Board and the Office of Public Roads before bonds for road construction can be sold. It was brought out that to secure the approval of the Office of Public Roads it was necessary for a mass of data of a specified character to be provided and an investigation made by the Office of Public Roads, after which an entirely new set of data and a new investigation along similar lines must be given to and made by the Federal Reserve Board. By resolution, the convention urged that the Office of Public Roads and the Federal Reserve Board cut out the unnecessary red tape and arrange so that the data obtained for one could be used by the other and thus prevent holding up a decision on projects which might be found worthy.

The convention, which opened April 15 in a big wooden building known as Liberty Hall, was attended by approximately 1000 delegates and guests representing twenty-seven states. It therefore was quite national in its scope, particularly as delegations were present from as far east as New York and as far west as California. The South was much more fully represented than the North, for one reason because the association is really a southern organization and its officers are southerners, its headquarters being in Birmingham, Ala. It is southern also because the South at this time is most active in good roads propaganda.

Large Attendance

Another reason for the large attendance from the southern states is the fact that the latter half of the week at Little Rock is devoted to convention of the Bankhead Highway Association which fathered by Senator John H. Bankhead, president of the United States Good Roads Association. The secretary of the association also is secretary of the Bankhead highway.

The highway is a proposed transcontinental road designed to connect Washington, D. C., with the coast. The route is not definitely settled. In fact, there is a great deal of rivalry between various sections of the country as represented at the Bankhead Highway Convention now in session as to what cities the route shall pass through. Highway engineers from the Office of Public Roads have covered proposed routes from Washington to Memphis, Tenn., by way of Birmingham, and so far as can be determined at this time these three points are the only ones that are definitely settled. The enthusiasm of the good roads men from the various sections is equal to that of the various divisions at the time the Lincoln highway was laid out, and it seems almost certain that upon the establishment of a definite route road improvement along it will be rapid.

As the plan stands now highway engineers representing the Office of Public Roads and others will cover all contending routes, and upon their recommendation the route will be definitely established probably this summer.

During its convention the first three days the United States Good Roads Asso-

ciation re-elected Senator Bankhead as president for the ensuing year, Governor Charles H. Brough of Arkansas first vice-president, C. T. Lassiter of Virginia second vice-president, W. T. Eger of New Jersey third vice-president, and J. A. Roundtree of Alabama was re-elected as secretary and treasurer. The governor of each state was made ex-officio member of the board of directors.

A feature of the convention was a talk by the state highway engineers of most of the states represented of what they were doing in their states along road work, their methods of financing it, and their road building program in general.

Charles Henry Davis, president of the National Highway Association, was to have presented a talk on "How the United States Can Get Good Roads Everywhere Through a System of National Highways." He was not able to be present but his paper was read and his plan, together with the arguments for it, are presented herewith. It suggested legislation which would provide a system of National highways to be built by the National Government and supplement the state and county roads.

Among others who addressed the convention were A. G. Batchelder, executive chairman of the American Automobile Association, Governor Brough of Arkansas, Senator Bankhead, Senator Robinson, Charles S. Hamlin of the Federal Reserve Board and Morris O. Eldridge of the Office of Public Roads. Mineral Wells, Tex., was decided upon as the place for next year's meeting.

Hard to Gage Results

As to what the convention really accomplished, it is difficult to say. Certainly the atmosphere was not clarified much as to the Government's attitude on road building during the war. State highway officials gained something from the interchange of ideas of road building methods. A great deal of road building enthusiasm was aroused, but it is doubtful whether it can be cashed in on under present conditions. The Bankhead highway received a boost and what road work is possible throughout the South probably will concentrate along that line. The resolutions may have some influence with the powers that be, but that cannot be expected to be immediate.

Hours were devoted to extolling the advantages of good roads. This was a total waste of time as those who heard the arguments would not have been there if they had not been fully convinced on that point.

Concrete, brick and road surfacing materials had exhibits at Liberty Hall as did some of the road-making machinery people. Prominent among these was the exhibit of White road building trucks.

Mr. Davis' paper in part was as follows:

How can the United States—forty-eight of them—get good roads everywhere? One hundred million people want them. They have needed them 100 years or more. They have wanted them fifty years or more. Why have we grown into one of the great nations of the world, to be the only great nation without good roads everywhere? How did our more active and prosperous counties first get their good roads, such as they were? How did the few states, that as yet have only made but a beginning, get theirs? The answers will show us the way, if we have the honesty and the truth to follow.

One thing is sure. No such platitudinous resolutions as were adopted by the Chamber of Commerce of the United States at Atlantic City, Sept. 24, 1917, will help much. They advocate no plan. They have no real force or purpose. In fact, there is but one plan that will attain our great objective—GOOD ROADS EVERYWHERE. The only definite, concrete plan advanced from any source—NATIONAL HIGHWAYS. This is the plan followed in other countries where they have attained good roads everywhere, and is likewise the method whereby a few good state highways have been attained by a very few of our forty-eight states.

A great military authority of national repute and patriotism has said:

"National highways will do more than any other one thing for real development and defense of our country."

And yet we have voted billions upon billions of money, of which practically nothing is for military or industrial roads. Such a policy—or lack of policy—does not make for the confidence of our people. We are all for preparedness—real preparedness—for the defense of our country.

It is stated that 50,000 or more loaded cars are in transit that cannot be handled at our eastern, western and southern seaports. Loaded freight cars are standing on hundreds of miles of sidings within two or three hundred miles of these terminals. These cars cannot be moved. Flour, grain, lumber, iron and steel are stopped in transit. Lack of cars and locomotives, inadequate harbor facilities, docks, lighters, vessels, terminals, and tracks are all partly held responsible for the trouble. Shipments of freight, and even express, over distances of less than 100 miles, take weeks for their delivery.

This being true in time of peace within our home territory, although at war upon foreign soil, is it not obvious that in times of war within our own borders we would find ourselves absolutely without the needed transportation facilities? Such transportation preparedness is the rock upon which battles are won or lost.

The French, in 1870-71, were defeated largely for that reason. Troops held for days where they are not supposed to be, without support or supplies and food, become mobs, and mobs cannot fight.

Battles cannot be successfully fought unless the machinery of transportation for men, horses, artillery, equipment, ammunition, supplies and food is on time like clockwork. There can be no waiting, no delays and promptness in execution depends primarily upon transportation.

And how well equipped do we find our country in highway transportation facilities? Worse, far worse, than our railroads. And yet our highways should supplement our railroads as well as perform their natural functions. As a matter of fact, to all intents and purposes, we have not even begun to get good highways for peaceful, industrial uses. Hardly a mile of even our so-called good roads could stand the constant, intensive traffic of a military campaign. They have not been located or built with any thought of such possible use. Most of them are not even wide enough for industrial uses, to say nothing of their construction.

We seem to go ahead with our eyes shut and our minds closed to what Europe has accomplished in highway building. Germany, even today, in the midst of a life-and-death struggle with overwhelming odds, is putting more effort into building military and industrial roads than into almost any other one activity.

Our system of roads could be made to help out our railroads both in times of peace and times of war. There is, however, but one way to attain these results within any reasonable cost and time. Just as town or township roads were unable to properly serve a county, so county roads were found inadequate for state needs, and now we are seeing that state roads cannot serve the nation.

We must have a four-fold system of highways—national, state, county and town (or township)—before we can possibly hope for a road system that will serve our people. As these roads are paid for by the people, owned

150,000 Miles of National Highways

Built and forever maintained by the National Government, will also give us a system of STATE HIGHWAYS and a main COUNTY ROAD in every one of ALL the 3,014 counties in all our forty-eight States.

They will cost **$6,000,000,000.00**

(NOTE—Our 260,000 miles of railroad lines are capitalized at $22,000,000,000.00.)

If built in 20 years, this means each year **300,000,000.00**

Or for each person each year **3.00**

And for the average family of four persons, each year **12.00**

But as New York, Pennsylvania, New Jersey, Maine, New Hampshire, Vermont, Massachusetts, Rhode Island, and Connecticut, having only five per cent of the area of the United States, have one half the national wealth, these nine States in the Northeastern corner of our country will pay **ONE HALF** the cost of **BUILDING** and **FOREVER AFTER MAINTAINING** 142,500 miles of National Highways in the other **thirty-nine States** of the Union—therefore

The People of Alabama, Arizona, Arkansas, California, Colorado, Delaware, Florida, Georgia, Idaho, Illinois, Indiana, Iowa, Kansas, Kentucky, Louisiana, Maryland, Michigan, Minnesota, Mississippi, Missouri, Montana, Nebraska, Nevada, New Mexico, North Carolina, North Dakota, Ohio, Oklahoma, Oregon, South Carolina, South Dakota, Tennessee, Texas, Utah, Virginia, Washington, West Virginia, Wisconsin, and Wyoming **would each pay each year for their National Highways ONLY** **1.50**

But in their building they will pay back their cost by loads two to eight times those hauled on poor roads.

These Thirty-nine States of the **West, Middle West,** and **South** have 390 Senators and Representatives in Congress,—a **majority of 124 votes.** Therefore the **West, Middle West,** and **South** have the power to gain National Highways at **half their cost,** and **maintenance forever.**

Why not demand that your Senators and Representatives vote for the building and maintaining forever by the National Government of a system of

150,000 Miles of National Highways

by the people, and free to all the people, they can be located and built primarily to best serve the people, both in peace and in war.

Our states do not permit their counties to dictate the terms and conditions under which state highways shall be built. Our states would scout the idea of leaving to their counties the building of state highways passing through said counties. The nation cannot permit the states to dictate the terms and conditions upon which our national highways shall be built. The nation cannot permit the states to build them piecemeal. The nation must do the work, pay for it, and afterwards maintain our great system of national highways, that they may "exist to favor, foster and further the development of good roads everywhere in the length and breadth of these United States of America, and which will secure the benefits—social, moral, commercial, industrial, material, educational and personal—in the progress and uplift of the American people which follow in the train of easy intercommunication and transit between the great centers of population and distribution and the great rural productive areas of the nation, and "TO BIND THE STATES TOGETHER IN A COMMON BROTHERHOOD, AND THUS PERPETUATE AND PRESERVE THE UNION."

To repeat. Only by the method followed in other countries can we attain good roads everywhere. They all have built great NATIONAL military and industrial highways. There is no other road for us towards good roads everywhere than by and through a system of national highways built and maintained by the national government.

Must Look to Government

None of our transcontinental highway associations—standing for the building of north and south, east and west, roads—can hope for their realization except by and through their building by the national Government.

Many people in the small northeastern section of our country are antagonistic to the national Government engaging in road building. This section comprises the six New England states and New York, New Jersey and Pennsylvania. Comparatively few people in the South, Southwest, Mississippi valley states, Northwest, Rocky Mountain regions, and the Pacific states, comprising the rest of the country, appreciate or understand this antagonistic point of view. This objection is not confined to a particular plan, but to any participation in such an undertaking by the national Government. Of course all Easterners are not so opposed. The big, broad-minded, far-seeing men of vision know to the contrary. Also many people do not know the vital difference between so-called "Federal Aid" and national highways. The former means gifts of moneys to the states to help build roads. Various plans for this are suggested, but they are all fundamentally unsound because of the "aid" or "gift" feature contained in all. This method relieves the federal Government of all responsibility and will inevitably result in "pork" and not in roads. National highways, on the other hand, limit the mileage and fix the responsibility where the people can see and judge of the honesty and efficiency of their public servants, and assure the money getting into roads.

If there is one section of the country more than another where the good roads movement has not gained a foremost place in the minds of the people, it is the northeast corner, comprising New England and the middle Atlantic states:

Maine	
New Hampshire	Connecticut
Vermont	New York
Massachusetts	New Jersey
Rhode Island	Pennsylvania

There are many reasons for this, the most important being the following:—

Progress Made by Northeast in Roads

Item	Whole United States	Northeastern corner	Per cent
Population	91,972,266	25,868,573	28.0
Wealth	$107,104,211,917	$38,301,588,571	35.8
Improved roads (miles)	190,476	38,868	20.2
Land area (square miles)	2,973,890	161,976	5.4
Public roads (total miles)	2,199,646	268,534	12.2
National highways (proposed)	50,485	5,143	10.1

The states above named are, as a group, the oldest and wealthiest in the Union. Their population is comparatively dense. Large and wealthy cities abound. Their roads, while not by any means approaching what they should be, are in general superior to those of the remainder of the country. Much more money has been available for their improvement than for those located in the newer, more sparsely settled and therefore poorer states.

The percentage of improved roads in this northeastern corner is 14.47 per cent. In the remainder of the country only 7.83 per cent are improved, or relatively about half as great. This northeastern corner has 12.2 per cent of the total mileage of all public roads, while the rest of the Union has 87.8 per cent. On the other hand, the East has little to be proud of. This seeming superiority is really not as great as should be expected. The population is 28 per cent of the whole; the wealth, 30.4 per cent; the area, only 5.4 per cent. Surely the East has little to be proud of with such greater advantages.

Thus, it is shown that the central, western and southern states have made greater progress in road construction in relation to their wealth, population and area, and therefore ability, than the eastern states.

Without attempting to designate what type of road should be built in any section of the country, nor to predict the cost of same, it is quite apparent that to build an expensive asphalt boulevard in a sparsely populated district would be money thrown away. Likewise, to build a light, water-bound, macadam road to connect two large cities, a short 'stance apart, would be worse than folly. It is therefore obvious that national funds for national highways would be spent in an equitable manner, dependent upon the relative traffic which the designated roads would have to carry and which in turn bears a close relation to the density of population.

Of National Benefit

If, however, national highways should still seem to produce a balance to the good for the West and South over the East, such favoritism would still be only apparent and not real, for many reasons. The improvement of those roads which naturally would comprise a system of national highways will be primarily of national benefit also. To within a short time roads were always considered of purely local interest. For this reason, more than any other, they have remained unimproved. It is not necessary to go into arguments to prove how each individual road has its proportionate effect upon the prosperity and welfare of the entire country. As a typical example, the following will indicate how the East must vastly benefit by good roads in the West.

Practically half (47.5 per cent) of the manufactured products of this country are made in factories located in the previously named eastern states. Their area comprises only about 5 per cent of the total area of the United States. On the other hand, the raw materials used in this manufacturing come very largely from the remaining 95 per cent (95 per cent) of the country. The great army of people in the East, dependent for their living upon these manufacturing establishments, should therefore be greatly interested in the roads of the West over which their raw materials must be hauled for a greater or less distance. A like argument also applies to the raising of farm products in the West and their consumption in the East. Can any one argue that good roads in the West will not lower the cost of living in the East as well as the West?

The thirty-nine states of the Union outside of this small northeastern section have 78 votes in the United States senate to 18 representing the nine northeastern states. Some of these 18 are big enough and broad enough to know the untold value of such a system of national highways. These thirty-nine states also have 312 votes in the house of representatives, while the nine northeastern states have only 123 votes, some of which also know and understand the economic, financial, social and moral value of the national highways as the only vehicle by which the nation can attain good roads everywhere.

N. O. T. Meeting

KANSAS CITY, Mo., April 20—Assurances that Federal approval of road projects that showed real military or immediate economic necessity would be given aroused enthusiasm over improvement projects at the annual convention of the National Old Trails Association at Kansas City last week. Two hundred delegates, from nine states, came with fear in their hearts that their earnest work in promoting bond issues would go for naught. The following telegram from Henry C. Flower of the advisory committee of the capital issues committee was read:

"This board has not intended by anything heretofore given out to leave the impression that we are opposed to good roads. On the contrary, we are unanimously and enthusiastically in favor of good roads everywhere. Especially do we favor the construction of such roads as will be of imperative military or immediate marked economic value. Entertaining these views, we, however, reserve the right in the present dire emergency to pass upon each individual propostion according to its merits with the view in each case of submitting everything to the acid test of helping to win the war."

The road project that received immediate stimulation from this telegram was the improvement of the National Old Trails road from East St. Louis across Illinois, bonds for a third the cost of which have been voted by the counties, the state having already promised, with Federal money available, the other two-thirds. The Illinois delegates to the convention were urged to appeal to Governor Lowden and to Federal authorities and committees, for the release of this project, and the national association will help where possible.

The association adopted resolutions urging county courts and other bodies to refrain from changing the established names of highways on the National Old Trails route.

Officers were re-elected as follows: President, Judge J. M. Lowe; vice-president, C. W. Black; secretary, Frank A. Davis.

Return Loads Bureaus

How to Organize System of Motor Trucking to Save Transportation Waste

THROUGH the co-operation of state councils of defense, chambers of commerce, local war boards and motor clubs, the Council of National Defense, through its Highway Transport Committee and its state councils section, is building up a system for more efficient utilization of the highways of the country as a means of affording merchants and manufacturers relief from railroad embargoes and delays due to freight congestion. This system already is in successful operation in Connecticut and is being extended throughout the country.

The purpose is to take some of the burden of the short haul off the railroads and put it on motor trucks operating over the highways. Very considerable quantities of merchandise and materials of all kinds are now being carried by trucks operated by private concerns in their own businesses and by motor express and haulage companies. In a majority of cases, however, these trucks, after delivering a load, return empty, whereas there are shippers who would be glad to avail themselves of the opportunity to send a load back on such a truck to its home town if they knew it was going back empty. On the other hand, the truck owner would be equally glad to secure a return load because the charge made for hauling it would reduce his own haulage cost.

Serves Both Sides

To bring the shipper and truck owner together serves the interests of both. It doubles the efficiency of the motor truck, enables business men to make prompt shipments or secure deliveries in a day instead of several, relieves the railroads of much short-haul freight, and thereby releases cars for necessary long-distance haulage of munitions, equipment, and other supplies for our Army in France, and for foodstuffs, fuel, etc., for the civilian population at home.

The logical agency for bringing the two interests together is the local business men's organization in each locality—the chamber of commerce, board of trade, or by whatever name it is known. They are in direct touch with the manufacturers and merchants in their respective communities, they know the present difficulties of shipping and they have the facilities for most quickly and systematically putting the shipper in touch with the man who has the facility for haulage.

The method of doing this is by the establishment of a return load bureau—an information department that acts as a clearing house for this particular purpose. Once initiated, the work of such a bureau, in most cities, can be carried on by a single employee of the chamber, probably in addition to his other duties. If necessary or desirable, a small charge can be made to the truck owner or the shipper for the service to cover whatever expense may be involved in starting and maintaining the bureau. But the plan affords an opportunity to be of such adidtional service to members of the organization and to business interests of the city generally that the increased support which may be gained through it should offset the cost incurred. Apart from this is the opportunity it presents to be of patriotic service to our country by increasing its transportation facilities at a time when the safety of the Nation depends absolutely upon transportation.

Shortage of railroad cars and locomotives created a shortage of coal during the winter. Lack of coal slowed down production of steel, which in turn delayed ship construction. Insufficient coal for bunkering ships created a critical congestion of freight in Atlantic port terminals and in railroad yards hundreds of miles inland. A certain part of this congestion was due to short-haul shipments of freight within cities and originating in near-by points, 10, 20, or 50 miles from the cities. Much of this short-haul freight can be carried on the highways by motor trucks. It can be picked up at the door of the shipper and delivered at the door of the consignee, entailing only two handlings. It can be delivered the same day it is shipped, whereas the same shipment by rail would require several days if not a week or more. And the shipment can go forward by motor when a rail freight and express embargo precludes shipment by rail at all.

The practicability and dependability of motor-truck haulage not only within cities but between neighboring cities have been demonstrated fully. Hundreds of local and intercity motor express lines are in successful operation in widely scattered sections of the country. The return-load bureau system has been installed in England, where it is now considered unpatriotic to run a truck without a load. Manchester, England, for example, and all the surrounding cities have their return-load bureaus and have reciprocal arrangements whereby they exchange information regarding available trucks and loads. Consequently, any chamber of commerce in a city whose merchants are affected adversely by rail embargoes and delays, freight congestion or lack of sufficient and direct rail transportation, and where there is any considerable number of motor trucks, will not be embarking upon a doubtful experiment in establishing such a bureau.

A return-loads bureau can be established by a chamber of commerce without creating any legal liability to the shipper or assuming any other responsibility. The function pure and simple is to advise the shipper where and when a truck can be obtained to haul his goods and to advise the truck owner where a load can be obtained. It has been found in England that very often, when such a relationship has been established between the shipper and the truck owner, an arrangement is made between them for regular service, and they do not need to call on the bureau for further assistance, thus lightening the work to be performed by the chamber.

It is left entirely to the shipper and the truck operator to make their own agreement as to the rate to be paid for haulage, liability of the truck owner or driver for safety of the goods in transit, and so forth. It is expected, however, that the chamber of commerce will exercise reasonable judgment and precaution, inquiring into the reliability of truck drivers and endeavoring to correct any abuses that may arise.

No difficulty and no great amount of work are involved in establishing a reurnload bureau. All that is necessary is to follow the example of Connecticut where through the initiative of the state council of defense, return-loads bureaus have been established in fifteen cities. The council addressed letters to the chambers of commerce inviting their co-operation in the movement. Return post cards were printed and mailed to motor truck owners in the different cities. On the reverse side of the cards was a brief questionnaire to be filled out by the truck owner stating whether or not he would carry back loads for reasonable compensation, whether he would rent his truck at full capacity or partial capacity, number of trucks owned, number of hours a day or days a week the truck would be available under the return loads plan, its capacity in tons, etc. As these reply cards came back, they were filled in a 3 by 5 card index drawer, arranged by cities and by routes out of the respective cities. It developed from this canvass that there were in the fifteen cities more than 700 trucks of 1-ton capacity or more available for such service and that they operated over forty-nine main routes.

Obtaining Addresses

Names and addresses of truck owners may be obtained from the registration bureau in the office of the secretary of state or the commissioner of motor vehicles, as the case may be.

Duplicates of this master file were furnished by the state council of defense in Connecticut to the chamber of commerce in each of the fifteen cities, together with a map showing the location of each return-loads bureau and all the truck routes, numbered serially. Thus, the head of the bureau in each city knows just what trucks are available in the other cities and the routes over which they operate.

It is desirable that the state council of defense, where one exists, should indorse this movement, but it is not necessary that the chamber of commerce in any city should wait for it to do so. It is perfectly feasible for the chamber to initiate the work itself in its own community and then propose to similar chambers in neighboring cities to do likewise and establish an exchange of information. Having ascertained what trucks are available for hauling, the next move is for the return-loads bureau to circularize the merchants, manu-

(*Concluded on page* 28)

U. S. Must Have Foreign Trade for War Victory

By David Beecroft
Directing Editor Class Journal Co.

CINCINNATI, Ohio, April 20—As a nation we are no longer individualistic. No longer are we a people living to ourselves. The isolation of the western hemisphere is an exploded myth. We are a nation of the world, thrown into closest contact and closest co-operation with the old world nations in the war. No longer have we a new world on the western hemisphere and an old world in Europe. To-day we are one world. We have learned since 1914 that democracy exists in Europe as well as on this side of the Atlantic. Since then we have learned to our amazement how certain of the nations and peoples of Europe will sacrifice and die for that same brand of democracy that we have so long boasted of as a supposed special heritage of our own.

For three days 1000 business men representing the biggest business houses in America have been sitting from 10 o'clock each forenoon until midnight discussing this question of American individualism and our position in the circle of nations when the war is over.

1000 Delegates

These 1000 delegates have met in convention under the name of the National Foreign Trade Council. It is the fifth annual convention of this organization, which is made up of merchants, manufacturers, railroad and steamship men, bankers, exporters and others drawn from every quarter of the country and representing every phase of industry. This National Foreign Trade Council works for the improvement of our foreign trade and is non-political and non-partisan.

The convention held this year has been immeasurably more intense than those of former years, because export trade is now essential to our very existence as a nation. The war has given an entirely new aspect to it.

The war already has taught us that we have not within our own boundaries all the raw materials that we need to defeat the Hun in this war. These raw materials must come from foreign lands, thus: We must get nitrates from those arid, rainless plateaus in Northern Chile. Otherwise we cannot make those high explosives, our T. N. T. which is playing so great a part in the war. T. N. T. stands for tri-nitrate of toluol.

Without these Chilean nitrates we will not have enough fertilizers for our soil and, our farm productivity will drop off and our job of furnishing the food supply for our Allies will not be done as it should be.

We must have manganese from Brazil. Otherwise our steel output will drop off. We cannot have as many guns, shells, motor cars, airplanes, farm tractors, trucks and motorcycles as we must have.

It is essential that we get the jute fiber from India and the East. Otherwise we will not have those necessary sand bags to protect our soldiers in the trenches in France.

Rubber from Brazil and the Strait Settlements in the East is imperative for over hundreds of war needs—airplane tires, motor car tires, motorcycle tires, truck tires, etc.

For maintenance of life we need coffee from Brazil; we need tea from China and Japan; we require raw silk; we need wool from Australia and the Argentine; we need chrome from New Caledonia in the East as well as from South Africa; we need platinum from Russia, if we can get it; and we need many other raw materials that are not to be found within our own boundaries. We must import them.

To get these raw materials is the reason for export trade, call it foreign trade if you will. Foreign trade is a give-and-take problem.

We cannot continue to buy manganese from Brazil unless we give Brazil products that she wants in pay for this manganese. To-day Brazil wants coal, and we are giving it to her. Much of this coal is needed to get the manganese by railroad from the interior sections of the country to sea port at Rio de Janeiro.

To get coffee from Brazil we must sell her those manufactured products that she needs. To get her crude rubber we must follow the same route.

So it is with the all-essential nitrate of Chile. So it is with the equally-essential copper and other metals from Peru and Bolivia. So with the jute of India, the wool of Australia, the chrome of New Caledonia, the meats and grains of Argentina, and the tea and silks of the Orient.

Foreign trade is a two-way business. One country wants merchandise in payment for the raw materials it sells another country. Old manufacturing nations want raw materials in payment for the manufactured goods they sell to newer countries. No country wants to be paid in gold for all the merchandise it sells a trading nation, and neither does any nation want to pay for what it purchases in gold. The ideal foreign trade is where merchandise of one nature pays for that of another class, or where raw materials are exchanged for manufactured goods and vice-versa.

This aspect of foreign trade has been the underlying theme, that endless silver thread that was never lost sight of in all the discussion of these 1000 earnest, patriotic business men who took four or five days from their home business to push along this essential aspect of our national life.

Had you been to Cincinnati and listened to the deliberations of these 1000 men you could have come away with only one conviction, namely, that it is just as essential to our national security and permanency as a nation that we have foreign trade as that we have armies and navies and guns and ammunition factories. It is just as essential to our future position as a nation that we have our due hold on the raw materials of the world as it is that we have airplaines and huge factories.

This war has given us a new grasp on the raw material aspect of the world. If we could not get our manganese from Brazil our status as a nation would be lowered. The same is true of nitrates, chrome, jute, wool, etc.

It is now imperative that we do our part to build up foreign trade, because just in proportion as we do this are we gaining that due share of control on the raw materials of the world.

Great Britain's View

Look for a fleet second at how Great Britain views the world's supply of raw materials. She has formed what is termed a Ministry of Reconstruction to rebuild on the wreckage of war. This ministry has no fewer than eighty-seven different commissions engaged on this work. A complete survey of the raw material supply of the known world is being made. Plans are being formulated to conserve and coordinate all raw material movements within the British Empire, this including Canada, Australia, South Africa and a score of other possessions. The British government has announced that never again will she permit of storing up for years of raw materials such as was done by Germany to be used to destroy the nations of the earth and endanger civilization.

We as a nation have not started on this re-construction work, we have not as yet a definite policy relating to it, but we have learned the one great lesson, that raw materials from other lands are needed for our national existence and the only way to assure ourselves of them is through building up our foreign trade.

Our foreign trade, in view of the raw material situation, becomes a national duty devolving upon us. If we are manufacturers, producing articles needed in lands from which we secure raw materials, it is imperative that we develop trade with those lands. It is as essential to do this as to buy Liberty Bonds. No longer should we look upon foreign trade in such countries as something we might develop provided it coincides with our plans, but we should feel it mandatory on our part to do our share of assuring to our children's children, those raw materials of the world without which as a nation we cannot live and grow and take our place in the world.

Many patriotically inspiring stories were told about how our different industries were playing their part in contributing to our future greatness as permanency. John N. Willys told the 1000 delegates how in 1917 we exported $880,000,000 worth of motor cars and trucks and parts and how this baby industry exported last

year goods equal in value to the combined export of all agricultural machinery, electrical machinery and apparatus and all locomotives and railroad cars. In our exports for the year were 65,792 motor cars and 14,347 motor trucks. Our cars and trucks went to Chile in exchange for nitrates. They went to Argentina in exchange for beef, hides, grain, etc. They went to Brazil to help pay for manganese, rubber and coffee, and to many other nations such as Australia, South Africa, Strait Settlements, from all of which we must have raw materials.

Our car and truck exports for the last three years were:

YEAR	CARS	TRUCKS
1915.....	41,864	22,094
1916.....	61,922	18,921
1917.....	65,792	14,347

A. C. Bedford of the Standard Oil Co., who is in charge of oils for the Council of National Defense, gave figures to show what we have been doing to help win the war, by supplying gasoline, kerosene and lubricating oil to all our allies and also supplying those neutral nations from which we get raw materials. The co-operation among oil producers last year to give increased output reads as a chapter of romance. Crude oil, which is the base for all these, has been increased in production from 265,000,000 bbl. in 1914 to 328,000,000 bbl. in 1917. Our exports of lubricating oil have increased from 103,000,000 gal. in 1913 to 200,000,00 in 1917.

Gasoline Exports

In 1913 we exported 29,000,000 gal. of gasoline, and last year we exported 300,000,000, or more than ten times as much.

Our refineries have jumped into the breach and increased their daily capacity from 900,000 bbl. in 1914 to over 1,000,000 in 1917.

To care for all this great export increase we have had to add to our tanker tonnage on the ocean. When the war started in 1914 we had only 278,753 tons of ocean tankage under our flag, but to-day we have 1,106,754 tons, or nearly five times what we had not four years ago.

Our chemical industry has grown from a total factory value of $97,240,000 in 1916 to $146,160,000 at the present time. This industry is giving us our high explosives, our fertilizers, our dyes, our war gases and is aiding in 100 ways in the war. Another example of what chemicals are doing is the potash industry. Previous to 1915 we imported potash from Germany. We started its manufacture in 1915, when we made 970 tons. In 1916 we manufactured 9720 tons, or ten times as much, in one year. In 1917 we manufactured 42,000 tons, or a forty-fold increase in two years. Previous to the war we had no chemical export trade but we are rapidly developing one.

Advertising Motor Cars

CINCINNATI, Ohio, April 19—The art of advertising to sell motor cars and motor trucks in South American countries is very different from advertising these same goods at home. The Latin-American is one of the keenest buyers in the world but is not so familiar with advertising as are our home buyers. Consequently we must tell the Latin-American a plain, unvarnished tale of our goods. Carl Herkimer Green, in the export business in New York, gave some sound advice on Latin-American advertising at the Fifth National Foreign Trade Convention here. Among other things he said:

"There is one axiom in export advertising that every beginner must learn, 'You can't expect results in less than a year.' There is very little that can be accomplished in any line of export endeavor in a shorter period, but no matter how well your advertising campaign is prepared, you will not have tangible results until the first twelve months have past. After that your business will be cumulative, and it will grow stronger and more profitable just as you feed it with the right kind of catalogs, circulars and follow-up matter.

"Advertising to the whole world outside of our shores is one of the most powerful arms we have in defending our foreign trade. Advertising is particular American. It is a medium that we know how to handle, and it will be a means of defense for the trade that we have won in the period of intense competition that is to come after the war.

"Advertising already has done much to build up Latin-American trade. There are hundreds of manufacturers in this country who are selling in large volumes abroad who have never had a salesman south of Key West. These manufacturers have made a success of advertising to Latin-American buyers and have done so by their own efforts.

"An advertising campaign for Latin-American must include catalogs, dealer helps and a system of prompt correspondence. In your first year of advertising you will be studying the best forms of subsidiary advertising matter, for an advertising campaign to Latin-American markets is nothing if not susceptible to frequent change to meet the peculiar requirements of local conditions.

"The most successful export advertisements for Latin-America have been written in a simple, informative style—something similar to those advertisements in old volumes of our magazines. Such advertisements tell more of what the product will do than of how it is made. The advertisement does not claim more for the goods than they will accomplish. There must be no spirit of superiority or condescension in them.

"The illustrations for Latin-American advertising should be actual photographs of your goods. Pictures are the universal language. Have big pictures of your products and different views. Humanize your products, just as you do your domestic advertising, by showing people using the goods, working them, or wearing them. And if the goods are wood, metal or textile working machines, show some of the products they manufacture.

"Advertising in the local newspapers and magazines in Latin-America will prove effective for goods that sell to the better classes. Brazil, Argentine, Chile and Uraquay have excellent newspapers and magazines that give good returns to advertisers. As these reach the consumer only and as he has no facilities for importing they cannot be used to much advantage by the American manufacturer who has no distribution established. There are very few such trade or technical papers in Latin-America as we have in every industry in this country, so that if an ultra-technical argument must be made it will have to be presented by letter or circular. Your distributer can help you in the selection of mediums, but when it comes to placing your advertisement it will pay you to use one of the American advertising agencies that specialize in such foreign business. Latin-American rate cards are very elastic, and their agencies know far better than most local merchants what the bed rock prices are.

"If your product sells to the general trade, you must feature your trade mark or something equally distinctive about the package of goods. The lower classes in Latin-America buy by the trade mark."

Romance in Spruce

CINCINNATI, Ohio, April 19—There is a romance connected with the production of spruce timber from the forests of Washington and also in the rushing of lumber to build our Army cantonments, which was hinted at to-day when J. J. Donovan, a lumber man of the state of Washington, told the 1000 delegates at the Fifth Annual Foreign Trade Convention held here just how the lumber trade had united to serve the Nation.

The task was to get 1,000,000,000 ft. of lumber and get it converted into cantonment buildings within three months. John N. Willys said the work could not have been done in five months if it had not been for motor trucks. Over 100,000 railroad carloads of lumber have been supplied for airplanes, ships and army needs. Solid trainloads of lumber, each train with 1,000,000 ft., were run from Washington to the East. The longest trip occupying fourteen days and the shortest trip ten days.

The airplane spruce from the state of Washington is needed because it is a very light and resilient timber but also due to its strength and the fact that it will not splinter when hit by a bullet or shell fragment. Our airplane program calls for 10,000,000 ft. of this spruce per month, which is ten trainloads of 1,000,000 ft. each, or a trainload every three days.

There is a great waste in this spruce for airplanes, and at present not over 10 per cent of that cut has been passed as suitable for planes by the Government inspectors. We are furnishing our Allies with much spruce for airplanes, and it is easier to supply them because their specifications for it are not nearly so severe as ours. Ours are needlessly severe. Germany uses much inferior material in her fighting planes than we do.

We are not getting enough railroad cars to ship our spruce from Washington to the airplane factories in Ohio, Michigan, New York and other states. In March sixty-eight carloads of airplane spruce were cut and awaiting shipment. Airplane spruce and ship-building timber are being produced faster than it can be used. A certain amount of Douglass fir is being used in the heavier bombing planes for wing beams and other parts.

Enlist or Invest!

Bond Holder
New Style
Buy a Liberty Bond!
TO MAKE THE WORLD A DECENT PLACE TO LIVE IN
THIRD LIBERTY LOAN
ARE YOU HELPING PUT AUTOCRATISM KAISERISM BELONGS?
BUY A LIBERTY BOND

Liberty Loan window prepared by Harold L. Arnold, a distributer at Los Angeles, Cal. Read it and invest

WHAT is that about "millions for defense but not one cent for tribute?" Do you believe in that famous utterance? If the kaiser licks us, he may compel us to pay him $50,000,000,000 for immunity from further aggression. But the Government is only asking for $30 a head from all American citizens to fight the kaiser and make it impossible for him to impose any such requirement on us. For this $30 a head the Government gives its absolute promise to repay with 4¼ per cent interest. The property value back of the Liberty loan is not less than $250,000,000,000.

When you buy a Liberty bond you buy an investment that has a mortgage on nearly 3,000,000 square miles of the American continent, including Alaska and the islands of the sea.

Not considering for a moment duty, patriotism, courage, or any other ideal, or our desire to survive as a free people, and reducing the issue to the basis of dollars and cents alone, it will be cheaper for us to win the war than to lose it. Looted Belgium is levied $100,000,000 a year. Shall we spend our millions for defense or pay tribute under pressure such as that?

It does one good to read what the motor car makers and dealers all over the country are doing to help raise this quota of $30 a head in the Third Liberty Loan campaign. But do not stop at reading. Do your part by investing in bonds, and get the other fellow to do the same.

No Exemption

By Strickland Gillilan

If you cannot launch a bullet at the fiend
across the sea,
Buy a bond!

It will reach its little target straighter than
a homing bee—
Buy a bond!

If you've bought a lot before,
Don't believe you've done your chore—
Buy a half a dozen more—
Buy a bond!

'Tisn't often helping others helps yourself so
all-at-once—
Buy a bond!

Help the country, help your bankbook—every
slacker is a dunce!
Buy a bond!

If your country's saved, all right,
There's your money good and tight,
If it isn't—well, good night,
Buy a bond!

If the bond should prove a flivver, all the
money that you save
(Buy a bond!)

Isn't worth a single penny—what is money
to a slave?
Buy a bond!

It will keep the kaiser's hordes
Back, as well as two-edged swords!
If your pocket book affords,
Buy a bond!

If you are a common tightwad, loving no one
but yourself,
Buy a bond!

It's the surest and the sanest way to save
your measly pelf—
Buy a bond!

If you are a decent critter,
'Gainst the foe of freedom bitter,
God Almighty hates a quitter—
Buy a bond!

CHICAGO COMING ACROSS

Chicago, April 20—Up to date the Third Liberty Loan speedometer bulletin of the Chicago Automobile Trade Association shows that concerns in the trade have sold to their employees and others more than $500,000 worth of bonds. Vigorous efforts are being put forth to insure that the motor interests do their full share. Every second day during the drive the association will issue a bulletin showing the results to date, not only that all in the trade may be kept advised of the progress of the drive but also to spur up those who might otherwise be inclined to lag.

The official bulletin is in the form of a poster in patriotic colors, at the top of which appears a representation of a speedometer. The pointer is advanced on each successive bulletin to show the progress which has been made and to indicate the total of the bonds sold. Immediately below the speedometer are names of the concerns whose employees have bought Liberty bonds, with the percentage of purchasers relative to the whole number of employees. Where the number of persons to whom bonds have been sold exceeds the number of the employees of the firm, a plus percentage is credited.

Upon the lower portion of the bulletin, it is proposed, beginning with the one which will be issued on Monday, April 22, to print the names of concerns in the Automobile Trades Division which have re-

ported no sales. The second bulletin will indicate sales of $660,000 in bonds. About 300 firms have reported.

DENVER ON THE JOB

Denver, Col., April 20—The Denver Auto Trades Association Liberty Loan committee has brought in about $40,000 thus far in Third Liberty Loan subscriptions, out of a total of $5,661,000 by thirty teams. The drive proper started in Denver Tuesday of this week following the main part of the campaign throughout the other parts of Colorado, and it will continue until next Friday. The trades team is working in a specified district rather than exclusively among the representatives of the motor car industry. No classification has been made showing returns from the respective lines of business, but the motor tradesmen are reported as responding favorably in general, the same as in previous campaigns.

No official team was selected from the Denver Motor Club, but scores of its members and practically all its officers are taking an active part. An official offer was made to furnish a motor club team, but the general committee in charge of the Liberty Loan campaign did not wish committees representing many diversified organizations. Some 300 or 400 members of the motor club have been giving their cars two or three times a week for several weeks for War Savings Stamp canvassing and other war activities.

MILWAUKEE DOES ITS BIT

Milwaukee, Wis., April 22—By the splendid aid given by the manufacturers and dealers in motor vehicles and parts the Milwaukee campaign in behalf of the Third Liberty Loan already is a success. The city's quota is $14,600,000, and of this amount 90 per cent already has been subscribed, insuring a generous over-subscription, as during the first two loan campaigns. Among the largest subscribers among manufacturers and dealers are the following:

A. O. Smith Corp., Cutler-Hammer Mfg. Co. and Chain Belt Co., $100,000 each; Sivyer Steel Casting Co., $25,000; LeRoi Co., $20,000; National Enameling & Stamping Co., $25,000; Wadhams Oil Co., $10,000; Shadbolt & Boyd Iron Co., $13,000.

Many subscriptions from this group have not yet been officially reported.

CALIFORNIA TRADE IN THICK

Los Angeles, Cal., April 12—The Motor Car Dealers' Association is taking an active part in the Third Liberty Loan drive. By the plan of the central organization, it is up to each dealer to see that his employees do their part. The motor car industry as a whole is represented on the general committee. Some of the dealers are showing a willingness to assist employees old in their service in paying for the bonds by reducing the size of the installments. Others have arranged through the banks to carry the installments upon recommendation. There is a lavish display of posters in all windows and all demonstrating cars have a sticker attached to the windshield.

The Automobile club of Southern California, the largest organization of motorists in the country, is sending out literature supplied by the general committee to all its members. The club's insurance department purchased $30,000 worth of bonds, $15,000 through Los Angeles headquarters and the remainder divided among the branches throughout the territory served proportionate to the amount of insurance written.

ST. LOUIS BUYS BONDS

St. Louis, Mo., April 19—The St. Louis Automobile Manufacturers' and Dealers' Association has voted to buy $3,000 worth of the Third Liberty Loan for the association, which also has bonds of the previous loans.

GENERAL MOTORS SUBSCRIPTIONS

Detroit, April 22—Of the $2,500,000 subscribed by the General Motors and Chevrolet corporations to the third Liberty Loan, the Olds Motor Works, Lansing, contributed $200,000 to the total subscription. Michigan factories subscribed $1,700,000, or over 50 per cent of the total subscriptions. The plants and their quotas follow: Flint, $650,000; New York, $500,000; Detroit, $500,000; Lansing, $200,000; Pontiac, $200,000; Saginaw, $100,000; Tarrytown, $50,000; Fort Worth, $50,000; Oakland, $50,000; St. Louis, $50,000; Stockton, $50,000; Bay City, $50,000; Toledo, $50,000.

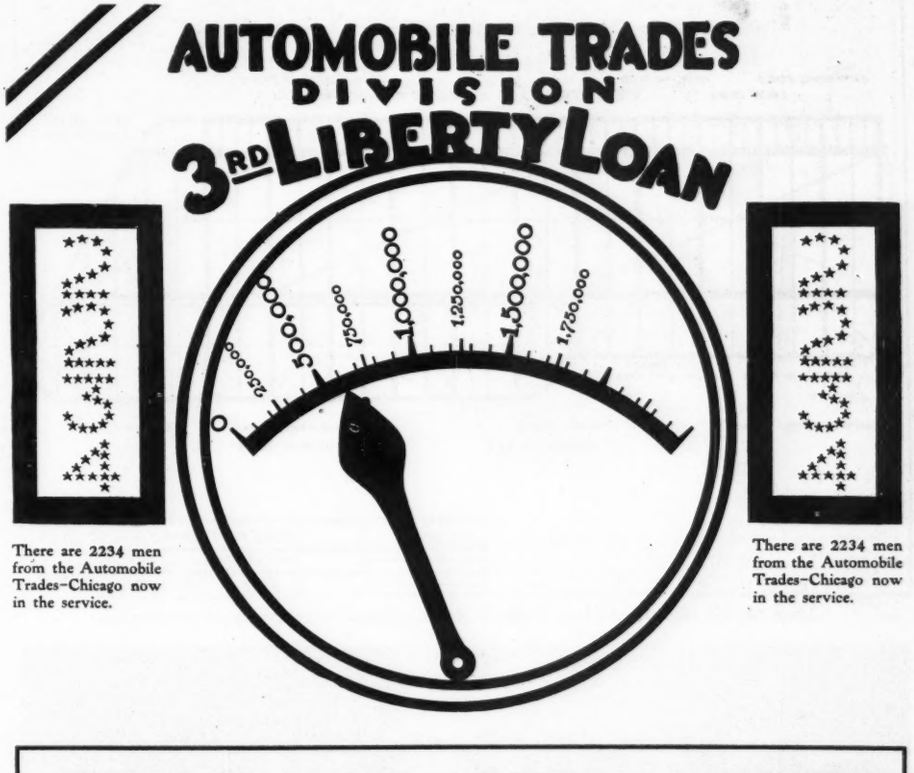
1700 TRUCK DELIVERY FIRMS

Detroit, April 19—Seventeen hundred motor truck transportation companies have been organized since Jan. 1 for inter-city deliveries, according to George D. Russel, secretary and treasurer of the Russel Motor Axle Co. The statement was made before officers, directors, department heads and employees of the organization at its war dinner recently.

NEW CADILLAC PRICES

Detroit, April 19—The increases in Cadillac prices, which went into effect April 17, are as follows:

MODEL	NEW PRICE	OLD PRICE
Seven-passenger	$2,970	$2,805
Four-passenger	2,970	2,805
Two-passenger	2,970	2,805
Victoria	3,365	3,205
Brougham, five-passenger	3,840	3,650
Chassis, 125 in.	2,490	2,345
Chassis, 132 in.	2,570	2,425
Chassis, 145 in.	2,610	2,465



There are 2234 men from the Automobile Trades-Chicago now in the service.

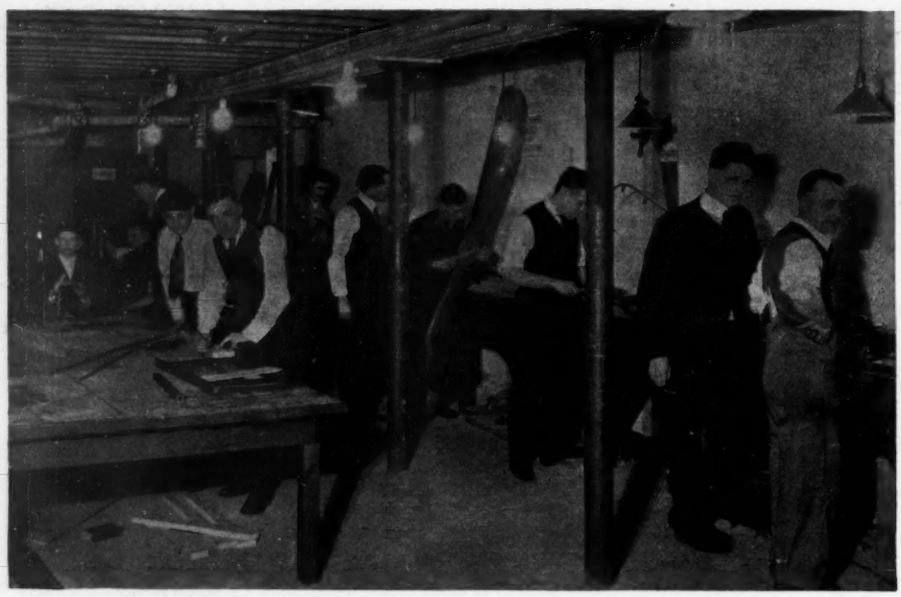
There are 2234 men from the Automobile Trades-Chicago now in the service.

WATCH THE SPEEDOMETER

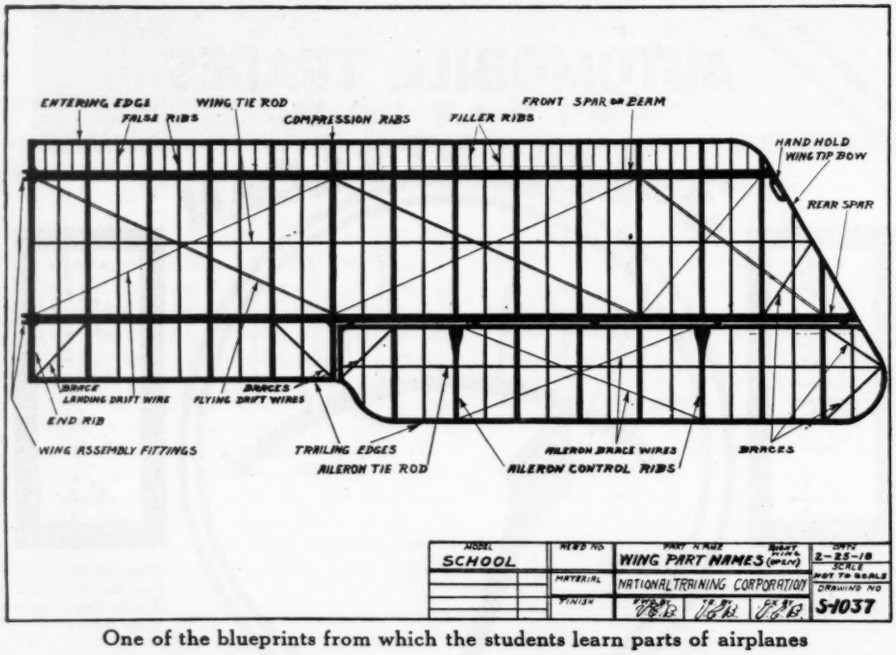
Firms in this Division who have reported sales

Percentage of employees who have bought bonds		Percentage of employees who have bought bonds		Percentage of employees who have bought bonds		Percentage of employees who have bought bonds		Percentage of employees who have bought bonds	
CUSACK LUTZEN MOTORS CO.	100+ 47%	H. PAULMAN & CO.	100%	VOLKCAR STORAGE BATTERY CO.	81%	AUTO REBUILDING CO.	48%	BABB SALES CO.	23%
ARMCO AUTO SALES CO	100+ 39%	PRUYN BALL BEARING WORKS	100%	ARMSTRONG TIRE & VULCANIZING CO.	47%	TRIANGLE MOTORS, INC.	45%	WM. SCHMIDT & SON	23%
ARNOLD & ARNOLD	100+ 33%	SERVICE TIRE & REPAIR SHOP	100%	EDWARD A. DAVIES, INC.	47%	STARR WOLF-BENNETT CO.	43%	AKRON TIRE & VULCANIZING CO.	20%
VANDERMAN CO.	100+ 33%	SIMMONS MFG. CO.	100%	KELLY-SPRINGFIELD TIRE CO.	44%	FEDERAL AUTO SHEET METAL WORKS	40%	STANDARD ELECTRIC LAMP WORKS	22%
WAGNER ELECTRIC MFG. CO.	100+ 33%	C. SORENSEN	100%	MORTON PARK GARAGE TIRE & VULC. CO.	40%	BERLIN TIRE CO.	38%	BERGER MOTOR TRUCK CO., INC.	14%
FRANCO AMERICAN AUTO LIVERY	100+ 33%	TIRE CO. OF AMERICA	100%	AMLBERG BEARING CO.	40%	SIMMONS MOTOR CO.	36%	BUELL MFG. CO.	50%
WORLD TIRE CORPORATION	100+ 100%	VAN CLEEF BROS.	100%	MOHAWK RUBBER CO. OF N. Y., INC.	41%	A. W. BLACKLEDGE MFG. CO.	30%	SCHMITT MOTOR CAR CO.	20%
G. F. COAL-OIL SYSTEM	100+ 89%	VAN NATTA-WOOD-COLES MOTOR CO.	100%	COLE STORAGE BATTERY CO.	38%	BRAZING & WELDING CO.	33%	SMITH COMPANY	20%
PHILADELPHIA STORAGE BATTERY CO.	75+ 31%	VESTA ACCUMULATOR CO.	100%	ANDERSON ELECTRIC CAR CO.	38%	BRIGHTON AUTO REPAIR SHOP	33%	KELLY-KOTH CO.	17%
ELECTRIC AUTO LIGHT SERVICE STATION	100+ 33%	FORD MOTOR CO.	63%	AMERICAN TASIMETER CO.	38%	LION TIRE & RUBBER CORPORATION	33%	AIR MANUFACTURING CO.	17%
CHICAGO MFG. CO.	100+ 11%	LEE TIRE & SALES CO.	63%	ILLINOIS SHERMAN CO.	33%	SCHAEFFER AUTO PARTS CO.	33%	AUTO CAPE TOP CO.	17%
OHIO STEEL COMPANY	100+ 8%	MASON TIRE & RUBBER CO.	60%	FIRESTONE TIRE & RUBBER CO.	31%	TERHART MOTOR, LTD.	33%	JOHNSTON MFG. CO.	17%
CHICAGO COACH & CARRIAGE CO.	100+ 7%	CARLSTEN-WILLIAMS	51%	ACORN TIRE & REPAIR CO.	30%	PHOENIX TRUCK MAKERS	33%	E. W. BATTERY CO.	15%
AUTOCAR SALES & SERVICE CO.	100%	EDWARD A. CANNEY, INC.	50%	AUTO LAMP REPAIR CO.	30%	VICTOR GEAR CO.	33%	CHICAGO AUTOMOBILE TRADE ASSN.	13%
PETER C. BOHN	100%	W. D. FORDHAM	50%	A-1 AUTO REPAIR SHOP	29%	OSGOOD LENS & SUPPLY CO.	30%	CENTURY AUTO TOP & SUPPLY CO.	10%
JOSEPH DIEDEL	100%	PACKARD MOTOR CAR CO. OF CHICAGO	50%	ILLINOIS CLEARANCE CO.	29%	AMERICAN CHAIN CO., INC.	29%	SOUTH SIDE DISTRICT	10%
FAIRMAN BEARING CO.	100%	DARNELL MOTOR CO.	79%	L. LAWRENCE CO. OF NEWARK, N. J.	29%	CICERO TIRE & VULCANIZING CO.	29%	FRED ALLEN AUTO SUPPLY CO.	10%
FOWLER LAMP & MFG. CO.	100%	HAUGHEY MOTOR CAR CO.	79%	STERLING TIRE & REPAIR SHOP	29%	CHICAGO MOTOR TRUCK SALES CO.	29%	CITY AUTO FABRIC CO.	100%
GLOBE INDEMNITY CO.	100%	JAMES LEVY MOTORS CO.	79%	TOPPS GARAGE	25%	LOUIS GEYLER CO.	28%	CHICAGO PAPER STOCK	9%
GUARANTEE TIRE & RUBBER CO.	100%	CHICAGO WHEEL & RIM CO.	75%	U. S. AUTO & REPAIR CO.	29%	E. DELPHANY & CO.	29%	ZOH, WHITTIER CO.	7%
INTERNATIONAL MOTOR CO.	100%	GORDON TIRE & RUBBER CO.	75%	VICTORIA TIRE & RUBBER CO.	29%	H. C. FERRO	25%	GLENN S. HOLMES	6%
MICHIGAN AVE. TRUST CO.	100%	LOCOMOBILE CO. OF AMERICA	75%	WILLIAM GRAHAM CO.	29%	CICLES & SERGON	25%	REO MOTOR CAR CO.	5%
MILLER & HOWDA	100%	GENERAL MOTORS TRUCK CO.	71%	DEARBORN TRUCK CO.	28%	WESTERN MOTOR CAR CO.	25%	WARNER-SWIT & CO., CO.	3%
NELSON & LEMOON	100%	FRANKLIN MOTOR CAR CO.	71%	A. S. FELSENTHAL	25%	MAGNETIC MOTORS CORPORATION	25%	JOHNS-MANVILLE CO.	1%
								TUTHILL SPRING CO.	1%

First of the speedometer bulletins to be issued by Chicago Automobile Trade Association



Here the students learn how to make airplanes. Fuselage, wings and propeller are made



One of the blueprints from which the students learn parts of airplanes

Students acquiring the theory of aviation preparatory to going into the shop work

Learning to Fly Through Flying

School Teaches Planes By Actual Construction and Experience in Air

A COMPLETE flying course is given by the National Training Corps with a ground school in Detroit and a flying field near Grosse Point, 15 miles distant. The ground course averages eight weeks. First the students are taken through a week's study of theory, after which a week is spent in the cabinet shop; three days in the fabric shop; two and a half weeks in the erecting shop; three or four days in the copper and blacksmith shop; two and a half weeks in the engine shop, and a week studying carbureters and magnetos. By this time the average student is ready to make flights. The school is two months old and has classes of forty students.

The flying course depends entirely on the individual but totals 15 hr. actual flying with the average man. This is cut up into periods of 15 to 20 min. After this comes 20 to 25 hr. solo flying. The student is then ready for the final tests. If he passes these he is given a license as air pilot. During the course the students receive instruction in wireless telegraphy, map sketching and reading.

Students Make Parts

In the ground school the students make all the parts except the engine by hand. V. C. Babcock, formerly senior aviator in the United States service, has prepared the entire course in the form of pamphlets and blueprints, each one covering a specific subject. As his assistant he has W. W. Herne, formerly of the Royal Flying Corps. The method of teaching is a combination of the American and French systems.

The school is erecting a hangar on its flying field 15 miles from Detroit to accommodate four machines. The tract of land is 1½ miles long and 500 ft. wide and is very level. This is only the first unit. There is a movement on the way to build barracks and run them after a military fashion but on a cost basis. No profit will be expected from this source.

The school now owns three planes, an L.W.F. six-cylinder Hall-Scott, developing 125 hp.; Curtiss 0XX2, developing 100 hp.; and a Curtiss CX of 90 hp. The ground school course, including field practice, costs $50. The flying course, including ground school, costs $300. If the student has had a course in ground school work and can pass the examination he can enter the flying course by paying $250.

RETURN LOADS BUREAUS

(*Concluded from page* 23)

facturers and other business enterprises in the community, advising them of the establishment of the bureau and asking them to report to it whenever they have any goods or materials which they wish to have halued, either within the city or to near-by

cities or villages. These reports may be made by telephone or on postal cards. Blank cards of a size suitable for filing may be supplied to shippers in quantity by the bureau for the purpose.

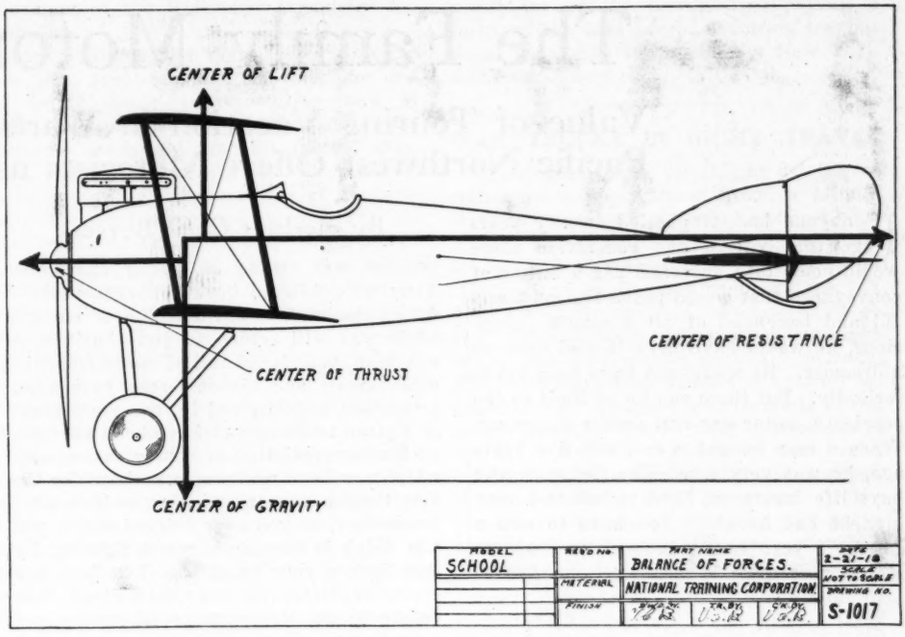
The telephone company should be asked to list the return-loads bureau under the title "Return Loads" in the local directory and truck owners and shippers be notified that by calling "Return Loads" or the telephone number of the bureau they can learn where a load may be obtained to carry back to the city from which the truck brought a load or where a truck can be obtained to carry the goods the shipper desired delivered. Publicity should be given in all the local newspapers and in those of neighboring cities of the establishment of the bureau, so that all interests may immediately begin making use of the facilities afforded.

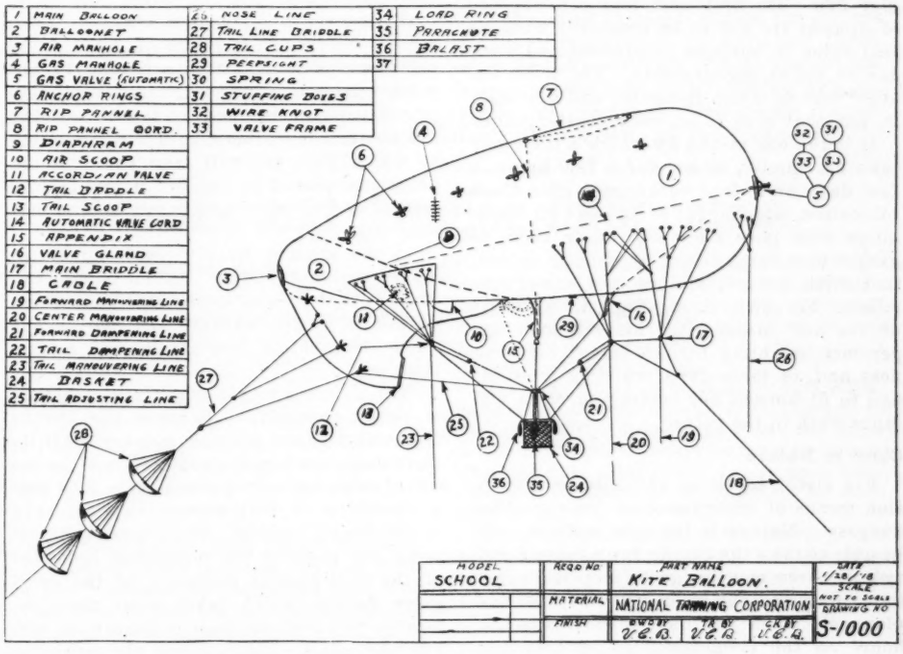
It will be found that there are two classes of business to be handled by the bureau—regular and irregular. In many cities there are motor express lines operating on daily schedule over regular routes and there are shippers who have regular shipments to make. Having brought these together once, further service of the bureau will be unnecessary so far as these particular parties are concerned. Then there are many companies, firms or individuals that own trucks which they use only in their own business but which stand idle part of the time or which from time to time deliver a load in a neighboring city and return home empty. There are also shippers who have depended on the railroad but in emergency wish to make a quick shipment. It will be necessary to keep a daily record of these and cross off the truck or the shipment as soon as it is learned that the truck has gone back to its home city and is no longer available or the shipment has been completed.

Obtaining Information

A system of daily interchange of information regarding this irregular service should be arranged with bureaus in other cities, so that a truck operator in Hartford, for example, who has a load to haul to New Haven can learn from the bureau in Hartford before starting where and on what day or what time he can secure a load in New Haven to take back to Hartford. He may find that by delaying his own shipment a day or by making it a day earlier he can get a return load, whereas otherwise he might have to return light. Shippers, therefore, should be urged to give as much advance notice as possible of shipments they wish to make.

Within a short time this system will extend to long distances. Recently a company in New York called up the chamber of commerce, before any return-loads bureau was established there, and stated it intended to send a motor truck to Vermont to bring back some machinery and wanted to know where a load could be secured to take to Vermont or at least a considerable part of the way. Another company called up and said it had a truck coming from Philadelphia with a load and wanted to get a load going back. Motor express lines are already operating on daily schedule between New York and Philadelphia, between Hartford and New York and between Boston and Hartford.





Two typical blueprint textbooks of National Training Corps school at Detroit

It is the purpose of the Highways Transport Committee to bring about, just as quickly as possible, the organization of return-loads bureaus in all the cities where it will be beneficial and to establish reciprocal relations among them on the plan of the Connecticut system.

Motor-truck dealers can be of great assistance to the chambers of commerce in promoting this movement and in helping to get the bureaus started. They are in direct touch with truck owners, know the routes over which trucks are operated, condition of the roads, railroad shipping facilitities, etc. It is recommended that the chambers of commerce call on them to appoint a representative committee from among them to co-operate with it. They can furnish a great deal of useful information and will be a valuable factor in disseminating information regarding the work of the bureau and making it 100 per cent useful.

ARMY MOTORS USE PIKE

Uniontown, Pa., April 19—The National Pike, one of the oldest highways in the country, running from St. Louis to the Atlantic, is being used as one of the principal interior transport routes to the seacoast.

Small transport trains of motor trucks already have passed over the National Pike, but the volume of military traffic is expected to increase rapidly as the summer progresses. In advance of the troop trains, representatives of the Red Cross canteen service are already going over the route, making arrangements with local Red Cross chapters to entertain the men.

The Family Motor Car

Value of Touring Vacation in Wartime — What Pacific Northwest Offers Motorists as Objective

By Herbert Cecil Burgess

IF anyone had prophesied twenty years ago that within one generation there would come into universal use a means of conveyance that would prove the most useful and beneficial of all a man's possessions, he would have been looked upon as a dreamer. He would not have been taken seriously. But there can be no limit to the service a motor car can render its owner. When a man bought a car, say, five years ago, he was very much like the man who buys life insurance, hard to sell and very glad he had bought. You have to own a car for a year or two before you begin to realize just what it means to you and to your family.

Most persons buy a car because it is necessary in their professional, business or social life. Its first cost and the expense of upkeep are not to be compared with its real value in business or professional work and in social engagements. Yet there are other uses to which it can be, and generally is, put that give it an even greater value.

It is the one means by which a man may take his family, either for a few hours, a few days or a few weeks, and give them relaxation, a change of scene, fill their lungs with pure fresh air, allow them to gather new inspirations by coming in contact with nature, and at the same time relieve his own tired, fagged, worn-out nerves and brain with this self-same experience, enabling him to forget his business and, in these days, wartime problems and to fit himself for better and more vigorous work in the future.

Close to Nature

The motor car is as valuable as a vacation means of conveyance as for any other purpose. Nature is its own restorer. To be able to take the family for a tour of one, two or three months, go or stop when you like, sleep and eat when you like, fish and play golf when you like, spend hours and hours on the mountain tops in the open air or on the seashore with its tang of salt breezes, your car not only becomes your private railway train, your own Pullman, but really and truly your family doctor.

Why? Because it is doing for you and your family what your doctor would advise you to do, what your doctor himself would do.

Just as certain as in disease it is necessary to cleanse the system of impurities and to remove all impediments to nature's working out its own cure, just so certain is it that in these times of great distress, worry, anxiety and overwork, it is necessary to get out into the open to give your brain a rest, to exercise the body, to get into the heart of Nature herself, so that she may restore your tired, worn-out mental faculties and build you up physically.

Your car is the doctor. It will take you wherever you want to go. It will find remedies for you and your children that will send them back to school brown as berries, healthy and strong as young cub lions. Your wife will go back to her household duties cheerful, rested and full of energy, while you will return to your business a new man, your lungs full of ozone from the pine forests and the salt sea; your mind broadened and inspired by the great heart of Nature to whom you have been so close; with an appreciation of your great country which you have really seen perhaps for the first time, a country which you love more fervently than you ever did and which you now think is even more worth fighting for than before your vacation. You feel, and are, more fitted and more determined than before to put every ounce of energy you possess into all those help-to-win-the-war movements with which you are connected.

Of course, a good deal depends upon where this vacation is taken. A holiday anywhere is good. It is a paying investment wherever it is spent, but just as there are remedies prescribed by the doctor that are better than others, so are there places to which your car will take you that are better calculated to produce a real lasting mental and physical recuperation than others.

In the summer time there is no better resort region than the Pacific Northwest, for it is the one spot on the continent where nature is really natural and where one finds his greatest inspiration and relaxation.

Why do we say that it is "where nature is really natural?" Because the Pacific Northwest is not a freak country. All its big things, its big features are not the result of extraordinary phenomena. It is not a repetition of Yellowstone, the Yosemite or the Grand Canyon. True, there are canyons, but there is the refreshing influence of the ever-present greenery, of the evergreen foliage which takes away their severity, and softens their influence on the eye and mind. There is not the awesome and the appalling quality in the scenery of the Pacific Northwest but rather the peaceful, the inspiring and the lovable. There is no part of the North American continent which brings a man so close to nature and to the Divine Architect as the Pacific Northwest, for in it he learns some conception of the Infinite Idea of the beautiful and he must gain from it new ideals, new aspirations and a more kindly outlook upon life. It is this aspect of our great out-of-doors that sends a man back to his business a new, invigorated and virile persons, capable of tackling anything that comes in his way and determined that all his problems shall be solved vigorously and thoroughly.

Then, there is the climate. Perhaps the climate, after all, is of the most importance. It surely must mean something to get away from a temperature of from 80 to 105 in the shade with very little variation during the 24-hr., out into a country where the thermometer rarely, even on the hottest day, registers above 84, but is usually around 68 to 75 and to feel the welcoming breezes from the snow-capped mountains, the fresh water lakes and the great Pacific ocean.

When a man finds himself on the evergreen fairway of one of the forty golf courses or on the banks of a mountain stream or mighty river, shaded by the overhanging foliage, fishing for his favorite trout or skimming over the surface of one of the hundreds of fresh water lakes, of from 1½ to 100 miles in length, feeling the wonderful tonic breezes—surely no more ideal condition of life can be imagined.

Then there are the evenings, when the day's run is over, when the day's golf is finished, when the trout are waiting to be cooked for the evening meal, or when after dinner, either on the porch of the hotel or by the camp fire, in the open glade, in the woods or by the side of the highway or on the shore of the lake, and the long twilight before the night comes. That is the time when one gathers the real inspiration from this great Northwest. One feels that it is good to be alive in the evenings in this beautiful land.

Then there is the next morning. For when the twilight is gone and the night has come and the temperature is probably from 15 to 20 deg. cooler than the middle of the day, when the same weight of bed covers are necessary almost as in winter, one retires to rest and to sleep. It is the next morning that one realizes what a sleep it has been.

Where Rest Waits

Did you, before you left home, carry your business problems, your win-the-war activities and your social worries to bed with you? Were you a victim of insomnia? Did you feel the night so long because you could not sleep that you wished there were no night? Then, how good this morning in the Pacific Northwest must feel, conscious that for hours you have been lost to everything except this great restorative of nature.

Has your car proved to you to be a doctor? Surely, for it has brought you into a country in the midst of surroundings and in an atmosphere that has done you more good than all the city remedies that could have been prescribed.

The start in the fresh, cool, invigorating morning air on the next lap of your journey may be up the side of one of the snow-capped mountains or it may be along the banks of one of the western rivers or it may be through the forests where the heavens are almost shut out by a leafy dome 200 ft. above your head and where the roadside is fringed with ferns or with sweet briar higher than your car, or it may be along paved highways, looking out across the inland seas or the mighty ocean, sometimes by the side of children playing on beaches, on the cliffs, hundreds of feet above the

level of the ocean, or it may be that you are spinning over gravel or macadam roads, through orchards weighted down with their golden fruit or beside acres and acres of waving corn that show the fertility and the resourcefulness of this great Northwest. How peaceful one feels when he knows that the only law he has is his own sweet will. He may go, or he may stop. He may cover 150, 200 or 300 miles if he wants to in the day, or he may loaf by the roadside knowing that every 25 or 50 miles there is a good hotel or an excellent place in which to pitch his camp.

Those who say that there should be no tourist travel during these wartimes have not given the subject any thought. There is scarcely one of us who does not know what it means to have some relative, either a father, brother or a son, with the boys in camp or in France. There is not one of us that does not know what it means to watch the papers for the trend of events. Often the news is not very encouraging. Often it is depressing, and to say that the people shall have their minds continually occupied with these reports and that a man's daily activities in connection with his own business, Red Cross, Y. M. C. A., Y. W. C. A., Knights of Columbus, the Liberty Loan campaign, the selling of War Savings stamps, with no relief or no recreation, is simply absurd. It means that in the end the cheerfulness of the Nation will disappear, and that the people will become morbid and despondent.

To win the war every man must be physically fit. Every woman must be physically fit. The children must have a cheerful outlook on life and must be taught to forget that their brothers may never come back. One might as well say that all the moving picture houses and theaters should be closed, there should be no dancing, no parties, no clubs, no baseball, there should be nothing to distract the mind from the war and the war's activities. These recreations are better than none, but they are not the ideal recreations for wartime.

This year let your car be your family doctor. Let it take you out where the fresh air is, into the Pacific Northwest, the states of Oregon and Washington and the province of British Columbia, 550,000 square miles of scenery, including seven National parks and monuments. Give it a chance to let the great works of nature be the restorers of your own nature, so that your mind and body may be equal to all the calls that are made upon them and that you may be 100 per cent efficient to fight at home for those things that our country is fighting for abroad.

WANTS DEFINITE ROAD POLICY

New York, April 19—The New York Highway Traffic Association also is asking the Government to centralize control. In its meeting here this week it passed resolutions calling on the President and Congress to adopt some definite road-building policy and provide for some centralized control for the determination, construction and maintenance of highways throughout the United States and for the use of prisoners of war in road work. The broad aspect of road construction in the country was outlined by S. M. Williams, president of the Highways Industries Association.

Mr. Williams said that it was his opinion that the economic necessity for improved highway transportation was of greater importance than the immediate military needs and that the further shipment of our troops abroad will make it necessary for great quantities of goods to be transported to the eastern seaboard. As the result of this increased shipment of food, clothing and the other necessities of life, transportation congestion will be greater this year than it was during the acute period of last winter. Mr. Williams also made a plea for the use of prison labor on the roads, provided this work be carried on under the honor system instead of armed guards and chained balls.

The necessity for the construction of a vehicular tunnel connecting the lower end of Manhattan Island with the important freight terminals in Jersey City was also outlined by the chairman and counsel of the New York state commission created to confer on the matter with a similar commission from New Jersey. It was pointed out the serious coal shortage in New York last winter would have been averted if such a tunnel had been constructed and that the cost of it would have been more than saved in the reduction in the cost of getting coal into the city by lighters and tug boats. The tunnel is estimated to cost approximately $12,000,000, and there is a possibility of the Government paying a third of the cost of construction, leaving about $4,000,000 to be paid by New York and New Jersey each.

WAR TRUCKS IN NIGHT TRAVEL

Washington, April 19—Night driving of motor truck supply trains from the Middle West to the eastern seaboard has just been started by the motor division of the Quartermaster Department as a means of training the drivers for service in France. A division supply train of thirty-eight cargo and two tank trucks left Detroit last night on its 600-hundred-mile eastward journey. The truck companies will travel entirely independently. Camps are to be made at the proper hour, no matter what destination is reached, with the exception that open country will be selected rather than cities. Cooking utensils, food, tents and all the necessary equipment to make the truck companies self-contained are provided.

Driving of motor trucks in regular formation from factory to seaboard has proved itself an important part of the training program. Each motor supply train will make two trips, the first trip by day and the second by night, so that the drivers will have opportunity to accustom themselves to the conditions of both operations. It is expected that night driving will decrease the present daytime traffic congestion found on some of the highways.

Routes and Touring Information

Chicago-Grand Canyon, Ariz.

Chicago—Would like best route to Colorado, Arizona and the Grand Canyon. What is the round trip mileage and how are the roads in general?—W. O. Evans.

From Chicago go to Maywood, Lombard, North Glen Ellyn and West Chicago to Geneva; here you pick up the Lincoln highway and follow through DeKalb, Rochelle, Dixon, Sterling and Morrison to Clinton, Iowa. From this point west to Omaha there are three options. You can continue on the Lincoln highway through Wheatland, Mechanicsville, Cedar Rapids, Belle Plaine, Marshalltown, Ames, Grand Junction, Carroll, Denison and Woodbine to Omaha; or from Clinton go west on the Lincoln highway to DeWitt, then south to Davenport, Iowa, where you pick up the River-to-River road or Great White Way across Iowa to Omaha. The former goes through Iowa City, Marengo, Grinnell, Des Moines, Guthrie Center, Minden and Underwood to Omaha; the Great White Way is via Muscatine, Columbus City, Oskaloosa, Fairmont, Des Moines, Stuart and Atlantic to Omaha. The three routes are over dirt roads.

Use the Lincoln highway from Omaha to Cheyenne, through Fremont, Columbus, Grand Island, Kearney, North Platte, Ogallala, Bigsprings, Sidney and Pine Bluff to Cheyenne. Here leave the Lincoln highway and go south through Dover, Greeley and Brighton to Denver. At Greeley a side trip might be made to Estes park, 55 miles. Should you not wish to return to Greeley from the park, it is possible to go to Denver via Lyons, Boulder and Broomfield.

From Denver proceed south through Sedalia and Palmer Lake, Colorado Springs and Fountain to Pueblo.

Leaving Pueblo for the Grand Canyon, drive through Green Horn, Walsenburg, Trinidad, Raton, Springer, Watrous, Las Vegas, Pajarito, Canoncito, Santa Fe, Domingo, Albuquerque, Becker, Socorro, Magdalena, Quemado, Springerville, Concho, Petrified Forest and Winslow to Flagstaff, where you leave the main highway and drive north through to Grand Canyon.

This is a trip of approximately 2194 miles, using the Lincoln highway from Chicago to Cheyenne. The distance is about the same if either of the options across Iowa is chosen. The roads are mostly dirt, but in good weather will be found to be excellent for such type of roads.

Complete running directions, mileage, etc. are contained in Vols. 5 and 7 of the Blue Book, published by the Automobile Blue Book Publishing Co., Chicago. Price, $3 per volume.

From Nashville to Atlanta

Chattanooga, Tenn.—Editor MOTOR AGE—You have probably been advised by this time of the unfortunate experiences which a number of Southern dealers have had in attempting to drive their customers' cars through from Nashville to Atlanta, via Huntsville and Gadsden. Some 400 cars were tied up on this bad stretch of road from Huntsville to Gadsden for several days. Nine women of the National Guard reserve, driving Reo trucks through were four days on the way from Nashville to Atlanta.

We have had our man out making careful investigation of all the possible routings south from Nashville, pending the completion of the Dixie highway, and he states that unquestionably the best and safest routing from Nashville south is via McMinnville, Spencer, Pikeville and Dayton to Chattanooga. The road, of course, from Chattanooga to Atlanta is in pretty fair shape.

We will ask that your touring department route tourists as well as dealers driving cars south by this routing.—V. D. L. Robinson, Dixie Highway Association.

Effect of Traffic on Highways

Former State Engineer of Maryland Advocates Centralized Road Control to Meet War Needs

By H. G. Shirley

Secretary Highway Industrial Association and Former State Highway Engineer of Maryland

THERE has been on the highways of the country a great deal of freight traffic which they were not designed to carry, and which, when they were designed, was not supposed to be carried over them. In trying to find out the value of those highways to the state and to see whether they were a paying investment, we made a close study of the traffic that passed over them. There was no other way to ascertain the value of the highway unless we secured the amount of traffic that passed over them and the cost to carry that traffic. There is not a railroad in the country which first figures on the cost of travel of the traffic and the amount of tonnage it can haul. In knowing this factor in the highway it was impossible to know the type of highway to use. It was impossible to know whether the highway was a paying investment or not. So, in 1917, in Maryland we set out to find out the amount of traffic that passed over the road. Maryland had just completed the complete system of roads at that time, about 1,400 miles, thoroughly connected up. On this 1,400 miles the traffic was taken. This is about 10 per cent of the gross mileage of Maryland, the gross mileage being 16,500 miles.

The results of the traffic figures for 1917 are as follows. The figures are based on a 12-hr. day and about 20 per cent should be added to them for traffic that went over the roads after that 12-hr. period on the 1,400 miles. There was carried 102,000,200 tons of pneumatic tire travel and 41,975,000 tons horse-drawn highway traffic. There was a total amount of 144,213,325 tons, about 103,000 tons per mile per year, approximately 300 tons per mile per day, over the entire system of 1,400 miles.

Separating Traffic

That gives you an idea of the total amount that was hauled. We went one step further and tried to separate the traffic into what is known as passenger traffic and traffic that did hauling—produce and other supplies—and we found that about 50 per cent of the entire traffic of the state was pleasure or passenger traffic and 33⅓ per cent was from produce and merchandise and 16⅔ per cent was miscellaneous, such as stone and different products of that character—lumber, etc. The amount of farm produce, therefore, is about 100 lbs., rather 100 tons per mile per day. This makes 200,000 tons per mile per day delivered over the entire road system of Maryland into the cities. Divide that by the number of tons it takes to support a man a day and you get the number of men each mile of the road system is supporting in Maryland.

These figures were taken after a careful study. Traffic men were put out at certain points and they would take the traffic one day in the month, a different day of the week in each month; for instance, in February on Tuesday and on down through the week and around again. If at any time we felt a condition coming in—a traffic sheet came in showing an unusual condition at that point—we would go back and then check that traffic sheet to see whether it was correct or not. It was found that we could carry this traffic over the road. In trying to get at the amount of tonnage that passed over the road and the cost to the state to this tonnage, we found this tonnage could be carried over the rate of .4 cent per mile. That is what it cost the state to carry the traffic. In putting those figures out it was done to give our people an idea of the value of the road system and what it was costing them and what they were getting out of it.

I think Maryland at the present time is concerned and handling as many Governmental activities as is any other state. They have the testing grounds at Aberdeen, they have the warehouses being built in Baltimore, the shops for these products in Baltimore, a great many munition plants, the radio station at Annapolis, Camp Meade and a number of others, and being as close as we are to the National center and knowing that we have about as much patriotism among our people, working with about as much spirit as any state in the Union, we are in close touch with the Government. Therefore, it is no reflection on our people when I tell you that they came forward and said:

"We will do everything in our power to assist this Government in winning the war, but we do not believe we can assist this Government in winning the war in any better way than building roads, building main roads to bring into the market the products that ordinarily would have to go over the rail roads. Therefore, we want, even in this war time, when taxes are high, we want the legislature to appropriate a sufficient amount of money to fill in the main gap and to build those roads that are necessary to bring the produce into the main centers, and for military purposes."

I am glad to say that this was done. Our legislature made a very liberal appropriation for the continuation of the roads. We have had roads that you may at times have believed would be of very little military importance. To take one road as an illustration that turned out this winter to be of great value to the Government, I will tell you of the road we built leading from Baltimore to Indian Head, where the Government has a testing ground for shells and armor plate. The road leads from the railroad station to Indian Head. All the shells and armor plate are brought down the Potomac river by boats, unloaded at Indian Head, where the different products are tested. Now, last winter the Potomac river froze so tight no boats could get up or down for three weeks. This occurred at a time when it was absolutely necessary that the Government should make tests of certain shells and armor plate, as well as deliver a great quantity of supplies to that post. This road was thrown into immediate operation, motor trucks were put on it, and thus the requirements of the Government were met without any closing down whatever of that plant for three consecutive weeks, the Government being furnished by this method with all the supplies and testing material that was necessary.

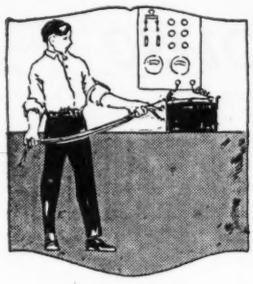
Likewise, when the Government started the proving ground at Aberdeen, a great many temporary houses or sheds had to be constructed at Sandy Hook, and those materials necessary for that work had to be shipped by rail down to Aberdeen for the workmen to start to work on them. Due to embargoes and the railroad congestion around New York, it was absolutely impossible to handle the material required in the construction of those temporary sheds which were to be set up and used as houses or shelters for the workmen. However, a line of motor trucks were put on in Baltimore, and those motor trucks delivered over the state road all the lumber, nails and other necessary hardware to build and complete these sheds or temporary shelters for the men—houses, dining rooms and kitchen rooms—supplying the entire requirements at that point.

The roads under this enormous strain have gone to pieces. They broke down, especially at that period of the year when the frost was coming out, and this heavy traffic over them broke up the macadamized roads that had not been designed for such heavy traffic.

Collects and Distributes

The highway is a collector. It is a distributer. I mean by that that the highway goes out into the country and collects the freight and delivers it to the railroad, and, after it is sent to the railroad terminal it again takes it up and delivers it to the manufacturer, or delivers it to the merchant and after it has been manufactured again takes it back out into the country, when the merchant thus delivers it to the consumer. Therefore, like the railroad, it is absolutely essential in these times especially that the highway problem should occupy as permanent a part in all our Governmental agencies as do the railroads or waterways. If we allow this important means of transportation to go down into the abyss of misuse, fall into decay, as it is today—for as you well know, there are certain pieces of roads that were not designed to carry the character of traffic that has to pass over them, and they will fall into decay if they are not properly maintained and sufficient material furnished to maintain them—and, if they are not maintained, we thus will break a link in the chain of transportation, a link that is just as essential as any link in that chain. A chain is no stronger than its weakest link. If you allow any one of these means or methods of transportation to lag and fall into decay, then you break your entire system down. Therefore, it is important that some centralized body of the Government should take this important question in hand and formulate a policy under which the various states of the Union can work and formulate a policy under which and by which they would know how to plan their work, know how much money they can expend each year and what roads will be of the greatest advantage to the Government in carrying on its war work and, also, what roads will be of the greatest advantage to the communities in hauling the produce from the farm into the centers of population.

At the present time the road or highway question in Washington is handled by one department head, which has no authority except to handle Federal Aid projects. That is the Office of Public Roads. Under the law the Office of Public Roads has no right to do anything to-day except experimental work and to supervise and look after Federal Aid projects. Due to the enormous amount of traffic thrown on the roads and the importance with which they are ranked, it is absolutely essential that the Government should have some one authority who will speak and promulgate a policy that will put this transportation where it should be.



Electrical Equipment of the Motor Car

By David Penn Moreton & Darwin S. Hatch.

Editor's Note—Herewith is presented the ninety-second installment of a weekly series of articles begun in MOTOR AGE, *issue of June 29, 1916, designed to give the motorist the knowledge necessary to enable him to care for and repair any and all of the electrical features of his car, no matter what make or model it may be. At the conclusion of this series, "Electrical Equipment of the Motor Car," with additions, will be published in book form by the U. P. C. Book Co., Inc., New York, in a size to fit the pocket conveniently.*

Part XCII—Eveready System for Ford Cars—Concluded

THE first wire protruding singly from the taped group is to be connected with the taillight. To accomplish this, run the wire along the left side of the chassis to the taillight as shown in Fig. 502. If the taillight has a two-wire socket, the extra wire coming from the socket should be grounded. The remaining wires should be brought forward along the side member of the chassis and fastened permanently.

The long wire, having double branch wires with large loop ends, is for connection to the headlights. Pass this wire along the left side of the chassis, Fig. 502. The first pair of branch wires are to be connected to the socket at the back of the left headlight and the loop is to be grounded under the nut which holds down the left side of the radiator. The second pair of branch wires is to be attached to the right headlight socket in the same manner as with the left headlight.

The shortest remaining wire is for the ignition connection and should be attached to the ignition post of the coil box, which is located above the rear spark plug. In making this connection care should be taken to keep the ignition wire as far away as possible from the high-tension wires leading to the spark plugs.

Two wires without terminals remain. The shorter of the two is to be connected to the left sidelight. To do this push the wire up through the crack between the dash board and the floor board, run the wire up inside of the body and out through the small hole, which should be drilled through the metal cowl near the rear of the side lamp. The other wire is to be attached to the right sidelight and should be brought up through the same crack used for the other wire and passed across the inside of the car to the right side in whatever manner is most convenient. In the event of the sockets in the sidelights being two-wire construction, the second wire from each lamp must be grounded to some metallic connection on the chassis frame.

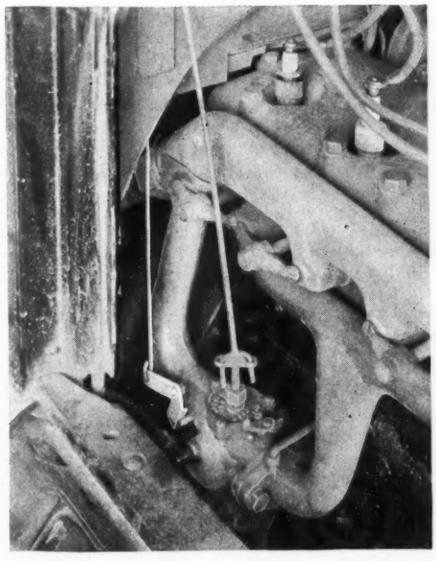


Fig. 504—Installation of bell crank to operate strangler in the Eveready system on the Ford

In case the car is not equipped with electric sidelights tape the ends of the two wires furnished for this purpose and secure them underneath the chassis where they will not be in the way. Proper staples are furnished for attaching the wires to the dash board or wooden body sill of the car.

After all connections have been made, battery ground cable 116065, Fig. 499, is to be connected to the battery and grounded under the runningboard as in Fig. 502. To do this, pass the small end of the cable through the rear porcelain insulator in the battery box and bring the cable under the running-board to the bolt nearest the car body on the runningboard supporting bracket and permanently fasten it in position.

To complete the wiring system, attach the battery ground-cable lug to the positive post of the battery and secure with the cap screw provided for that purpose. Before making this connection thoroughly clean the connecting post and the cable lug and then apply a thin coat of vaseline.

Fuses

Fuses are provided inside the lighting switch, connecting corresponding terminals in the upper and the lower rows of terminals. There is a separate fuse for each circuit, ignition included.

In case of the fuse melting due to short-circuit on any part of the lighting circuit or primary ignition circuit, another piece of 10-ampere fuse wire should be inserted.

Bell Crank

It will be noted that all Ford cars are equipped with a wire running from the strangler valve of the carbureter forward and through a hole in the right side of the radiator frame. This wire is made more accessible by having one end attached to a bell crank on the carbureter strangler valve and run up through the dashboard where it is within easy reach of the driver's hand.

To install the bell crank remove the original Ford strangler wire, and where it formerly was fastened to the carbureter attach the bell crank by the screw with nut and lock washer, Fig. 504. Then fasten the wire through the hole at the end of the bell crank, pull the wire through the opening in the floor board where the speedometer shaft is located, and cut length of wire to suit.

Hand Crank

When it becomes necessary to turn over the engine to permit of grinding of valves, etc., unfasten the round plate in front of the starter unit and insert the hand crank supplied.

The Readers' Clearing House

The Electric System

Wiring of 1914 Cadillac

Q.—Give wiring diagram of 1914 Cadillac. This model of which I wish diagram has two-speed rear axles.—F. O. Barney, Seattle, Wash.

This is shown in Fig. 1.

Remy Wiring System

Q.—Show method of attaching the wires to the switch of the Remy type. I took this switch apart and there were two wires burned off.—H. S. Prescott, East Liverpool, Ohio.

You fail to mention the type of system you have, but we are showing the connections of the various units, including the switch, of models No. 3SL, 62-OC and 25, in Fig. 6.

Voltmeter on Hupmobile

Q.—I have a 1915 model K Hupmobile that I would like to fit with a voltmeter on the dash. Give a diagram how to wire it. Also instruct how to connect a spotlight. What horsepower is the model K engine rated at?—W. H. Flanagan, Columbus, Ohio.

To fit a voltmeter it is only necessary to place the instrument on the dash and run the wires from it to the storage battery. One wire goes to the positive terminal and the other to the negative. The reading on the dial gives you the electrical pressure only.

A spotlight can be connected as shown in Fig. 2, grounding one of the wires coming from the spotlight switch.

The advertised horsepower is 36 and the rated horsepower 18.

Wiring of 1914 Michigan

Q.—Give wiring diagram for 1914 Michigan touring car equipped with Auto-Lite generator, supplying current to headlights, sidelights, dashlight, taillight, with battery, ammeter and ignition connections.—Reader, Chicago.

MOTOR AGE has no wiring diagram of this car, but we show in Fig. 5 the Auto-Lite system used on the Abbott-Detroit about the same time. This will give you the general arrangement of the different parts and the manner of connecting them.

Tonneau Light on Hudson

Q.—How can a tonneau lamp be connected on a 1918 speedster?

2—How are the storage battery indicators, described in MOTOR AGE a short time ago, installed?—D. S. Herbrecht, Grinnell, Iowa.

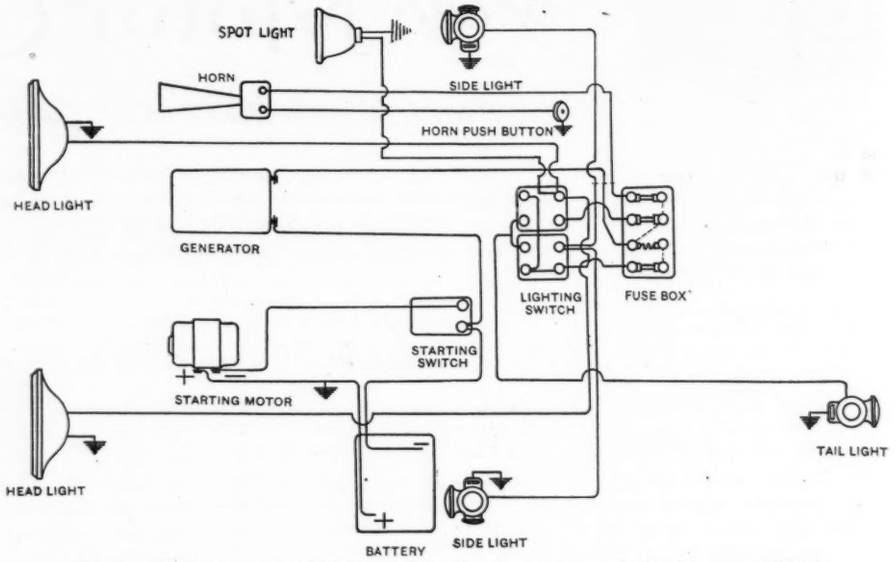


Fig. 2—Diagram of the 1915 Hupmobile, showing manner of attaching a spotlight

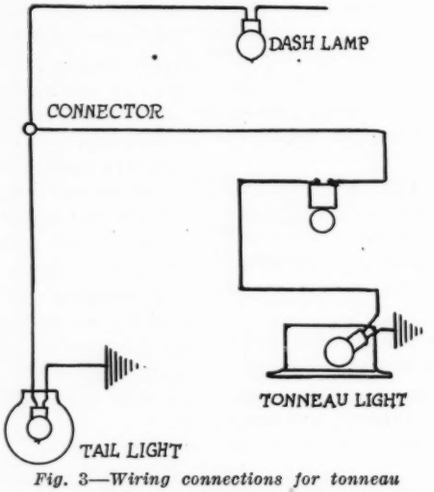


Fig. 3—Wiring connections for tonneau light on a 1918 speedster

1—The manner of connecting a tonneau lamp on a Hudson speedster is shown in Fig. 3. Trace the taillight wire to the connector, to which the dash lamp runs also. Then run a wire from this to a switch and finally to the cowl lamp. The other wire from the latter should be grounded. Very often the switch is integral with the cowl light.

2—The Jewel battery gage is connected by running a wire from each one of its terminals to the terminals of the storage battery, leaving it in circuit all the time. It really constitutes a form of voltmeter.

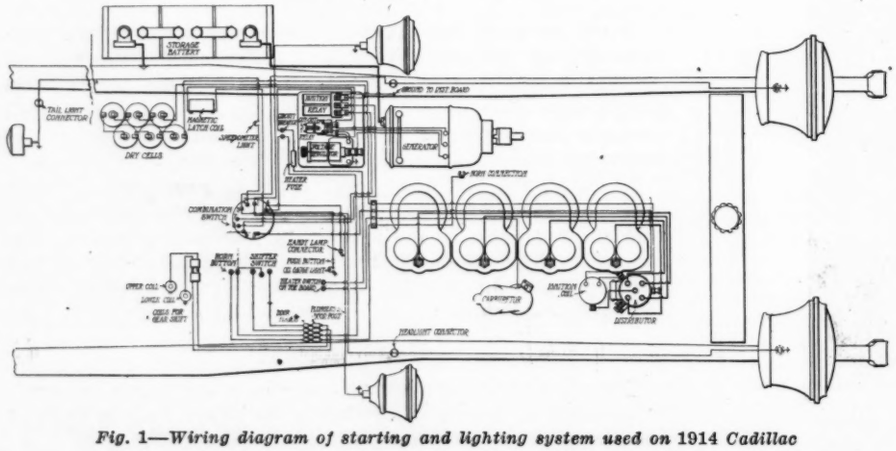


Fig. 1—Wiring diagram of starting and lighting system used on 1914 Cadillac

Wiring of 1915 Chevrolet

Q.—Give wiring diagram for the starter, lighting and battery ignition on the 1915 Chevrolet. Do you consider one- or two-point contact wiring more advantageous?—F. S. B., Boise, Idaho

Two wiring systems of the Chevrolet are shown in Fig. 4. The one at the top was used on the earlier models and the other on the later ones. The advantage of the single wiring system is that only about half of the wire is used as when the two-wire system is installed. It simplifies the wiring and the tendency among makers now is to fit this system. With the single-wire system good insulation is important, as the changes for grounds is greater than with the other form.

Function of Delco Relay

Q.—What is the duty of a relay in the older style of electrical systems such as on the 1913 Oaklands, and what takes their place on the later systems?—N. C. Ensworth, Warren, Pa.

The relay in the old Delco systems is connected in the dry-battery ignition system and serves to break the primary circuit immediately after it is completed by the auxiliary contact mechanism in the timer, thereby inducing a high-tension current in the secondary circuit, resulting in a spark at the plugs.

A cross-sectional view of the relay is shown in Fig. 9. Magnet A attracts armature B when the current is completed through the timer. This action opens con-

tacts C, breaking the primary circuit. The condenser D is mounted beside the coil. The magnet A consists of two windings, one of rather heavy wire and the other fine. Current ceases to flow in the heavy wire when the contacts C are opened. The fine wire holds the armature down after the circuit in the coarser wire is opened. If it were not for the fine wire winding, the making and breaking of the coarse winding would give a vibrating spark at the plugs instead of a single spark.

In the modern Delco systems the relay has been replaced by a combined timer and distributer system. The distributer and timer, together with the ignition coil, spark plugs and wiring, constitute the ignition system. The source of supply can be from storage battery, dry cells or generator.

Must Replace Ammeter

Q.—I have been having trouble with the lights on my Overland 85. They will burn real bright for a few seconds, then some of the lights will burn out; acts like too high voltage. Battery is connected and keeps charged, as my self-starter works all right, but lights will only burn when engine is running. The ammeter is disconnected. Would that have anything to do with lights?—J. T. McDermott, Gallup, N. M.

You will have to connect up the ammeter again in order that your lights may burn when the engine is not running, as the current flows through the ammeter before going to the lights. Obviously, if the instrument is removed, the circuit is broken.

Miscellaneous

Oiling on Chevrolet

Q.—On a 1913 Chevrolet roadster model H-2 publish a diagram showing the oiling system. Explain why the oil gage on dash never works, though at the same time the engine is getting the proper lubrication.—G. J. Wilson, Milwaukee, Wis.

MOTOR AGE has no diagram of this oiling system, but these cars were equipped with an oil gage attached to the by-pass; this by-pass being attached to the main feed pipe. In this by-pass is a small adjusting screw which regulates the amount of oil to pass to the gage.

If the oil does not pass through the gage it is most likely due either to the adjusting screw being turned in too far, shutting off the supply of oil, or it might be that dirt has become lodged in the small brass tube which runs to the gage. This may be determined through the inspection of these parts.

Acid Test of Platinum

Q.—Explain acid tests of platinum and tungsten magneto points to ascertain if they are genuine. How many pounds should the magneto from a Bosch magneto model D U-4 lift when fully magnetized. What is the lowest revolutions per minute of the armature of a Bosch D V-4 magneto in perfect condition and yet produce a good spark at plug points under ordinary compression?—Subscriber, Plymouth, Ill.

With the price of platinum prohibitive at the present time it would be almost foolhardy to test the points for genuineness, inasmuch as some of the metal may be reduced by treatment with the acid. Genuine platinum dissolves in nitro-hydrochloric acid, forming the acid H_2PtCl_6. Fusing alkalies will affect it, especially a mixture of caustic potash and saltpeter. Platinum will not dissolve in nitric acid, hydrochloric acid or sulphuric acid. Therefore, if you test the metal with these and no chemical action is observed, better take for granted that the points are genuine.

MOTOR AGE knows of no simple way to test for tungsten. Tungsten is very hard and difficult to fuse. It is not changed by contact with the air at ordinary temperatures. Nitric acid and aqua regia, the latter a solution of concentrated nitric acid and hydrochloric acids, convert it into the trioxide. Tungsten is used in the manufacture of steel. The addition of 8 or 9 per cent makes steel very hard.

The magnets when fully charged should be able to lift about 15 lb. Smaller magnets are fully charged when they can lift 10 lb. or so.

If the magneto were in perfect condition it would probably deliver plenty of current for a spark at speeds less than 100 r.p.m.

Inquiries Answered

TO assist readers in obtaining as a unit all information contained in this department on a certain subject in which they may be most interested, such as ignition, carburetion, etc., MOTOR AGE has segregated inquiries into classes of allied nature. Questions pertaining to engines will be answered under that head, and so on.

THE ELECTRIC SYSTEM

F. O. Barney.....Seattle, Wash.
H. S. Prescott.....East Liverpool, Ohio
W. H. Flanagan.....Columbus, Ohio
Reader .....Chicago
D. S. Herbrecht.....Grinnell, Iowa
F. S. B.....Boise, Idaho
N. C. Ensworth.....Warren, Pa.
J. T. McDermott.....Gallup, N. M.

MISCELLANEOUS

G. J. Wilson.....Milwaukee, Wis.
Subscriber.....Plymouth, Ill
C. E. Mawdsley.....St. Louis, Mo.
R. M. S.....Stockston, Ill.
F. S. B.....Boise, Idaho
R. A. Woodward.....Sandwich, Ill.
Jack Curtiss.....Lansing, Kan.
D. S. Herbrecht.....Frinnell, Iowa
Roger ShawHastings-on-Hudson, N. Y.
Roger Shaw.....
.....Hastings-on Hudson, N. Y.

CARBURETION

C. H. Warnken.....Poth, Tex.

EXPERIENCES

F. T. Sergent.....Belvidere, Ill.

ENGINES

B. F. Sanders.....Mamers, S. C.
B. F. Stempsey.....Youngstown, Ohio
C. H. Warnken.....Poth, Tex.
C. E. Hawdsley.....St. Louis, Mo.
W. H. Flanagan.....Columbus, Ohio

No communication not signed by the writer's name and address will be answered in these columns.

Drive to One Wheel Only

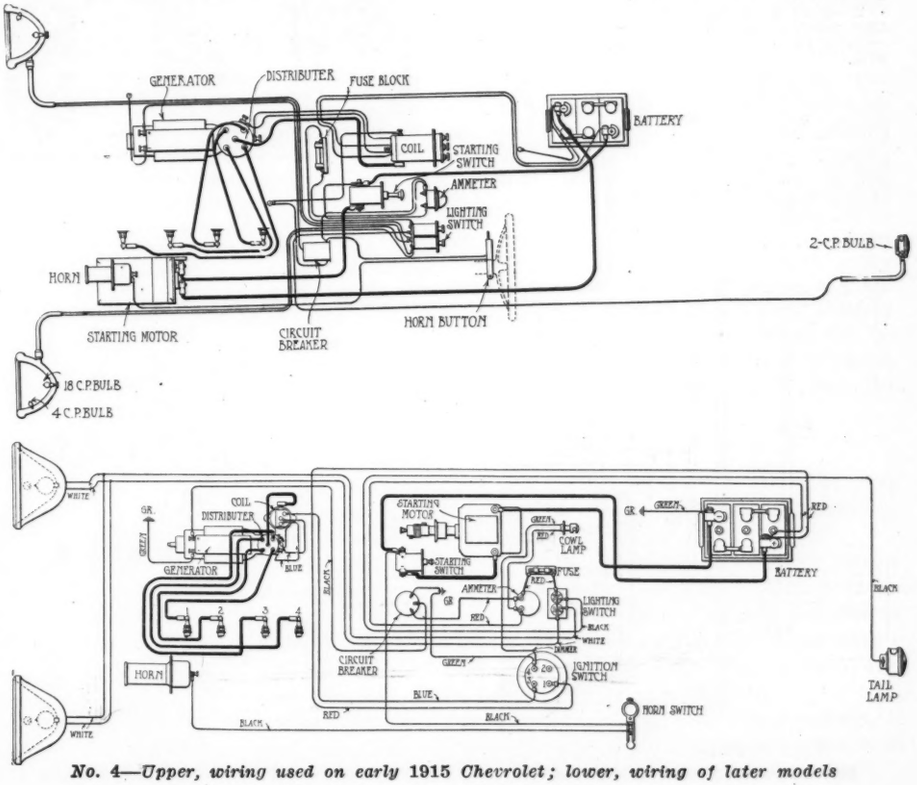
Q.—Is there such a thing as one wheel that drives a Ford? How about the driving wheel on other cars?—C. E. Mawdsley, St. Louis, Mo.

MOTOR AGE does not know just what you mean. Both of the Ford rear wheels are driven at the same time, as is also the case with other cars. You may be thinking of the Bailey non-stall differential, which drives the wheel which happens to have traction.

Cleaning Radiator and Top

Q.—What can be used to clean out the radiator and water chambers of a car?
2—What can be used for renewing a panasote top, and what can be used on imitation leather seat cushions to brighten them up?—R. M. S., Stockston, Ill.

1—One of the best ways to do this is to put into the radiator and jackets a hot concentrated solution of common washing soda. Run the engine for a while, making sure that the water is circulating. Then let it stand over night, running the engine again in the morning for several minutes. Then drain off the solution and refill with clear water. Use soft water if possible.



No. 4—Upper, wiring used on early 1915 Chevrolet; lower, wiring of later models

2—There are any number of preparations on the market for this, and you will find some of them advertised in the columns of MOTOR AGE.

Van Sicklen Speedometer Drive

Q.—Advise whether the Van Sicklen speedometer is operated from the front wheel or driveshaft.—F. S. B., Boise, Idaho.

The Van Sicklen speedometer is operated from the front wheel on some models and by spring belt running over pulley on driveshaft on other cars.

Complies with State Laws

Q.—I drive a Ford car and have no dimmers for the lights but use Warner lenses. Do I have to put dimmers on to conform to the laws of Illinois and other states?—R. A. Woodward, Sandwich, Ill.

We are informed by the makers of this lens that it complies with the state law requiring some form of dimming device.

Specifications of Saxon and Ford

Q.—Give weight and specifications of the Saxon six and Ford engines, also the revolutions per minute and horsepower developed.

2—Which engine will develop the most revolutions per minute, a four or six-cylinder?—Jack Curtiss, Lansing, Kan.

1—The weight of the Saxon six engine is 489 lb. The cylinders measure 2⅞ in. by 4½. It develops 36 bhp. at 2600 r.p.m.

The Ford engine weighs 468 lb., complete with gearset. It has a bore and stroke of 3¾ in. by 4 in. MOTOR AGE does not know the brake horsepower of this engine, but the S. A. E. rating is 22.5.

2—Some six-cylinder engines turn over faster than some four-cylinder and vice versa. It depends upon the design.

Has Trouble Shifting Gears

Q.—Why is it when shifting from first to second the gears will not mesh when lever is moved slowly, but when lever is quickly moved from first through neutral and jammed hard into second no trouble is experienced? On this model is there a brake behind clutch to stop gears from spinning while shifting and, if so, explain adjustment of same?

2—I wish to put a new steering wheel on this machine and would like to know how to remove the old one.—G. J. Wilson, Milwaukee, Wis.

1—There is no brake on the clutch other than the clutch collar which binds on the shoulder of the clutch hub when the clutch pedal is pushed in. Perhaps the trouble you are having is due to the fact that the clutch does not fully release, so that the gears turn at all times. This might be determined through inspection. If found to be the case the throw of the clutch pedal could be adjusted by an adjustment under the front floorboard. It might be that the brakes are adjusted too tight, so that when releasing the clutch the brakes are applied.

The shifting of gears is a knack and may be learned only through experience. In shifting slowly with the clutch still turning some gears might be turning faster than others. In this way they clash. If you are unable to locate the trouble through these suggestions take matter up with a mechanic.

2—Steering wheels generally are held on by one or two keys and a locknut. To remove it is only necessary to take off the nut and pull off the wheel with a wheel puller. Or it sometimes can be driven off with a mallet and block of wood.

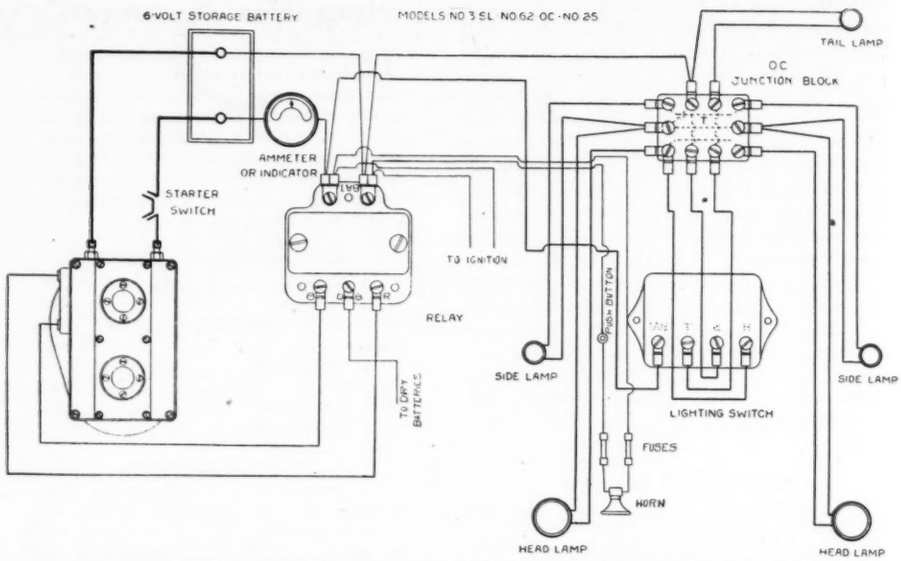


Fig. 6—Wiring diagram of the Remy lighting system, showing connections to switch

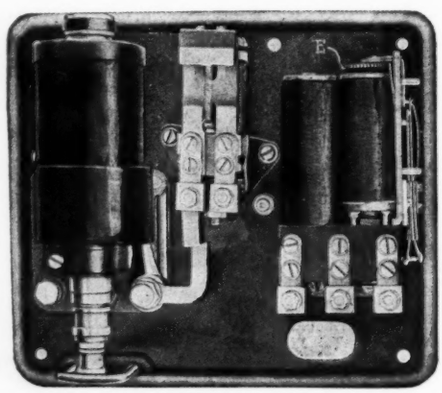


Fig. 7—General view of earlier form of Delco relay

Cut-Outs on Cadillac

Q.—How could both cuts-outs on a Cadillac eight be connected so as to work on one pedal?—D. S. Herbrecht, Grinnell, Iowa.

In Fig. 8 is shown a scheme for putting a cut-out on each exhaust line of a Hudson and operating them with one pedal. The pulley at the front makes a sort of equalizer, so the valves will be opened the same amount, regardless of how the cables are attached to the levers.

Makers of Delage Car

Q.—Give information relative to the Delage motor car, its place of manufacture, etc.—Roger Shaw, Hastings-on-Hudson, N. Y.

The Delage car is perhaps best known in this country as a racing creation, inasmuch as it has appeared on most of the speedways, being driven by Oldfield, LeCain and others. The car is a French make, manufactured at Levalois, Paris. A view of the exhaust side of this engine is shown in Fig. 10. They appeared here first on the Indianapolis speedway in 1914, where they were driven by Rene Thomas and Albert Guyot. A feature of these engines was the use of ball-bearings through out, the crankshaft being carried on five robust bearings. Even the pump and magneto shafts ran on ball bearings.

Adjusting 1913 Hupmobile Carbureter

Q.—How can the carbureter on the Hupmobile 32 1913 model be adjusted? It is a Zenith. The engine will not run at all unless the choker is used.—C. H. Warnken, Poth, Texas.

There is no adjustment on this carbureter, as the latter has been constructed for the particular engine upon which it is used. The carbureter is automatic in action and a brief description of how it works may be

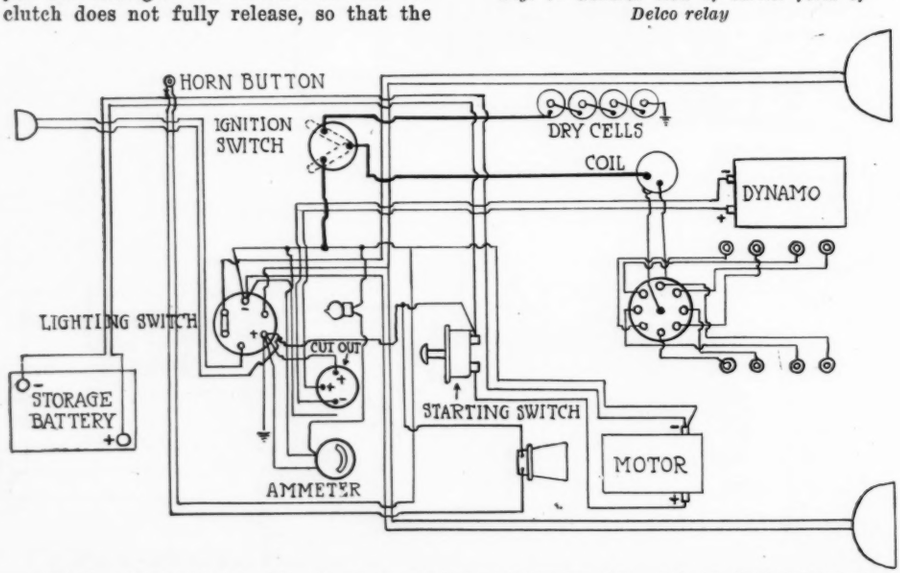


Fig. 5—Abbott-Detroit wiring diagram, which is similar to that used on 1914 Michigan

of value to you. It may be that one or more of the jets are clogged with dirt, in which case they should be removed and cleaned. Also examine the float mechanism and see that the float valve is tight. The chances are you will find dirt somewhere in the mechanism.

A cross-sectional view of this carbureter is shown in Fig. 11. Gasoline from the tank enters the strainer body D, passes through the wire gage D1 and enters the float chamber through the valve seat S. As soon as the gasoline reaches a predetermined height in the float chamber, the float F acting through levers B and collar G2 closes the needle valve on its seat.

Gasoline flows through three different channels in various quantities and proportions, depending upon the degree of throttle opening. With the throttle fully open most of the gasoline flows through the channel E and the main jet G, some flows through the compensator I, then through K to the cap jet H, which surrounds the main jet. At slow speed when the throttle T is nearly closed, they give but little or no gasoline, but as there is considerable suction on the edge of the butterfly, the tube J, terminating in a hole near the edge of the butterfly, picks up gasoline, which is measured out by a small hole at the top of the priming plug.

Counterbalancing Crankshaft

Q.—Would counterbalancing the crankshaft on a Buick 3 increase the power or speed? Would it eliminate the vibration, as with engine running fast fenders, headlight, etc., vibrate considerably? Is there any way to figure the correct weight of counterbalance necessary and what difference, if any, if counterbalance is too heavy? I am planning on applying a counterbalance shaped as a half circle. What weight should it be for counterbalancing piston and pins that weight 4 lb. and connecting rods that weigh 3 lb.?—W. H. Monroe, Clifton, Ariz.

Counterbalancing a crankshaft eliminates vibration and produces a much smoother-running engine. It allows greater engine speed and lessens considerably the wear on the bearings.

A distinction must be made between rotating and reciprocating parts, also between over-all balance and local balance. For instance, a mechanism like the one shown at left in Fig. 12 is in over-all balance, or static balance. It will remain in any angular position in which it is placed, and the centrifugal force on one arm is exactly equal and opposite in direction to that of the other. It is obvious, however, that the centrifugal forces on the arms will produce pressures on the bearings adjacent to them. The bearing load resulting from the centrifugal force on one of the rotating arms can be eliminated only by placing a counterweight directly on the arm.

This is practically all there is to the Hudson crankshaft. On each crank arm is a weight which exactly balances the arm and half of the adjacent crankpin or pins. It has been done previously in the case of crankshafts which have a supporting bearing between each pair of throws. Stearns, for instance, did it, but the Hudson company seems to have been the first to apply these counterweights to multi-throw cranks with crankarms with connecting crankpins 120 deg. apart. To these arms the balance weights necessarily must be applied at the side.

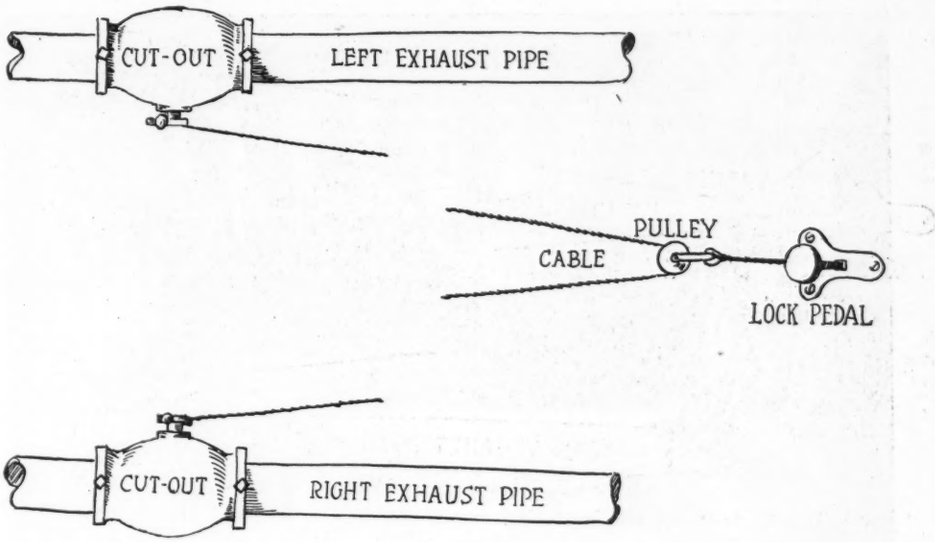


Fig. 8—Suggestion for installing cut-outs on Cadillac. The pulley equalizes pull of cables

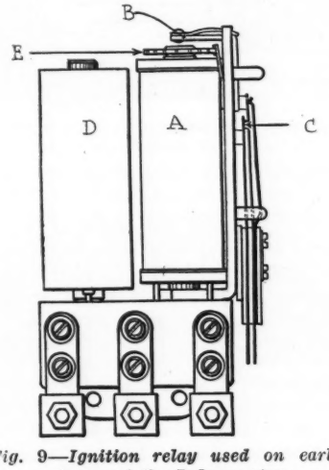


Fig. 9—Ignition relay used on earlier forms of the Delco system

In balancing rotating parts the moments around the crank axis must be equal. As a pair of crankarms and the crankpin between them constitute a definite moment, the balance weights must be made to form an equal moment. The moment is equal to the product of the weights into their distance from the axis of rotation, measured from the center of gravity of the balance weights. The connecting rod head and half of the connecting rod shank may be considered as rotating parts and be balanced in the same way as the crankarms.

The reciprocating parts, including the pistons, rings, pin-locking device, bushing and half of the shank of the connecting rod by their inertia produce a vibrating force in the cylinder axis, which varies in intensity and changes in direction. This force is directly proportional to the weight of the reciprocating parts, directly proportional to the length of stroke and proportional to the square of the revolutions per minute. In a six-cylinder engine the total reaction on the engine frame due to the inertia of the reciprocating parts is always zero. Suppose, for instance, that one pair of pistons is moving up and the other two pairs moving down, then the inertia force on the first pair is equal and opposite in direction to the algebraic sum of the inertia forces in the other two pairs for every position of the crankshaft. Thus, in a six-cylinder engine there should be absolutely no vibration due to the inertia of the reciprocating parts. This inertia, however, will cause bearing pressure, because the

This Is Another's Experience—Send in Yours

Carbon Removers

Belvidere, Ill., Editor MOTOR AGE.—I have used Johnson's carbon remover and Worko tablets with satisfactory success. Either one should be used only in half the cylinders of the engine at one time. Johnson's will soften the carbon into a loose spongy mass, which readily is blown out through the exhaust when the engine is started. The liquid should be put into the cylinder, ½ oz. to a cylinder, at night and left to stand until morning. The engine should be cool. Spray each charge into the cylinder with a grease gun so as to avoid its running out through the valves. To start the engine in the morning, a good method is to spray the cylinder walls with lubricating oil by using a grease gun through the spark plug bore or valve plug, as the preparation removes all the lubrication from the inside, which loosens the carbon.

The Worko tablets are to be used in a warm engine. Warm the engine up well, put two tablets into each of half the number of cylinders, get in and ride. Do not race the engine to start with. The action of the tablets is such as to generate a gas which unites with and burns the carbon into a loose, dry, gray powder. They do not affect the lubrication.

Both Johnson's carbon remover and the Worko tablets, if used according to instructions on the packages, will remove all the carbon and give absolute satisfaction.—F. T. Sergent.

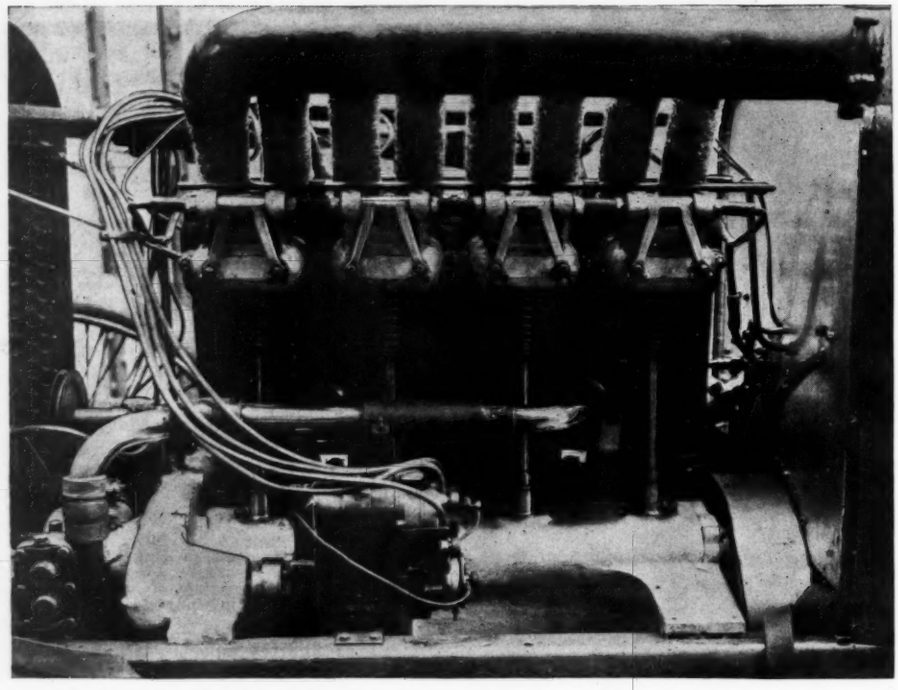


Fig. 10—Exhaust side of the Delage racing engine, showing valve-operating mechanism

parts which balance each other relatively are located on opposite sides of the bearings.

Reciprocating forces cannot be fully balanced by rotating forces such as centrifugal forces on rotating weights. The best that can be done is to reduce the maximum value of the reciprocating force by half. The principle by which this is accomplished is as follows. A rotating force may be resolved into two reciprocating forces at right angles to each other. By a reciprocating force is meant a force always acting in the same line but changing periodically in direction. The centrifugal force on a crankshaft balance weight may be resolved into a horizontal and vertical reciprocating force. If the balance weight is down when the piston is up, the vertical component of the balance weight centrifugal force will be opposite in direction to the inertia force of the piston. By making the two equal we would entirely eliminate the vertical force, but since we would then have an equal horizontal force we would gain nothing. But by making the vertical component of the balance weight centrifugal force equal to half the maximum value of the inertia force, we cut the latter down half. Of course, we also introduce a horizontal force equal to this half, but this is not so objectionable.

Engines

Timing 1913 Hupmobile

Q.—Give timing of the engine used in the Hupmobile 32, 1913 model.

2—Have an Inter-State model 30-1911, and it will not idle at all but runs and throttles down well when in gear. The car is Bosch equipped and the carbureter is raised, but have Stewart vacuum system. Valves and compression O. K. Give reason.—C. H. Warnken, Poth, Tex.

1—To facilitate the timing of the engine marks have been placed on the flywheel, indicating the points of opening and closing of the valves. These marks are seen when the cover over the gearset is removed.

In Fig. 13 is shown a diagram of the timing. It is essential to have a mark on the case to line up with the flywheel marks. The easiest obtainable mark is to mark one central with the case, as at A. Remove the valve cover on the side of the engine and turn up the mark 1 & 4 on the flywheel until it coincides with the mark A. The mark 1 & 4 1-0 indicates that the intake valve of No. 1 cylinder is just beginning to open. Without altering the position of the flywheel, turn the camshaft by the fan pulley on the front of the engine until the inlet tappet on No. 1 cylinder just begins to rise. This puts the camshaft and crankshaft in the correct relation.

Next remove the cover of the interrupter housing so you can see the magneto points. Move the lever D in full retard. Move the flywheel until the mark B 1 & 4 CL is 2 in. past the mark A on the crankcase. At this point the interrupter should just begin to break at full retard, shown by C. If the interrupter is not in this position loosen the nut on the magneto sprocket and turn the shaft around until it is in the correct position. See also that the distributer brush E makes contact with No. 1 segment, taking care that neither camshaft nor crankshaft turn while setting the magneto. The distributer cover can be removed by squeezing the springs G and pulling outward at the same time. When all the parts are replaced properly the engine is ready to run.

2—An engine that will not idle well may be getting too rich or too lean a mixture. It is also very likely that your engine needs a thorough overhauling, if it has been in service continually. There may be leaks in the manifold, defective insulation, etc., or the carbureter may be too old to handle the present-day fuel well at slow speeds. Leaks are one of the first things to look for, as the extra amount of air that is fed when idling often will stall the engine. When the throttle is opened, as when running under load, the extra gasoline takes care of the air and consequently the engine runs fairly well. If the carbureter has an auxiliary air valve, see that this does not stick in the open position when the throttle is closed and the engine idling. Weak magnets cause improper idling also.

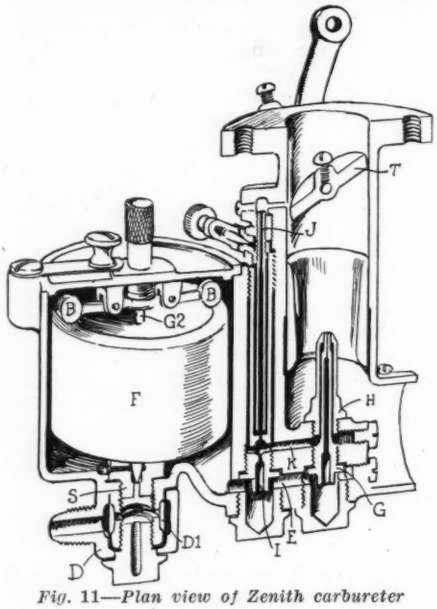


Fig. 11—Plan view of Zenith carbureter

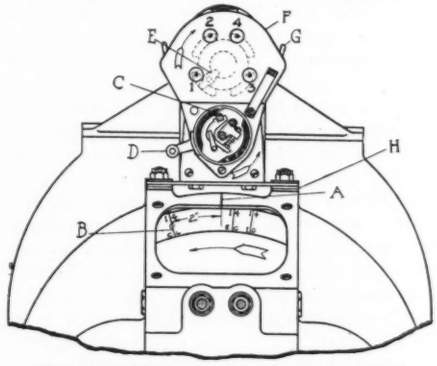


Fig. 13—Diagram showing the method of timing the Hupmobile engine

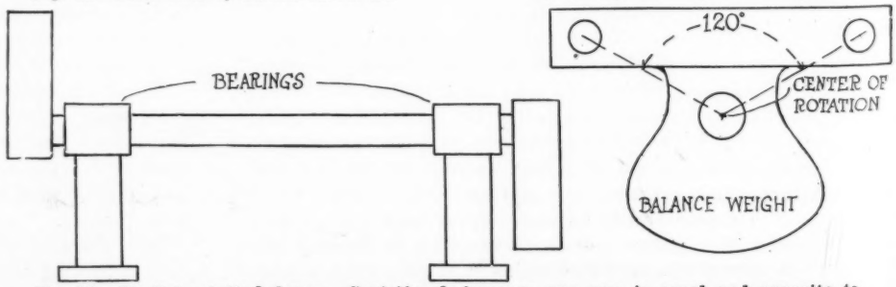
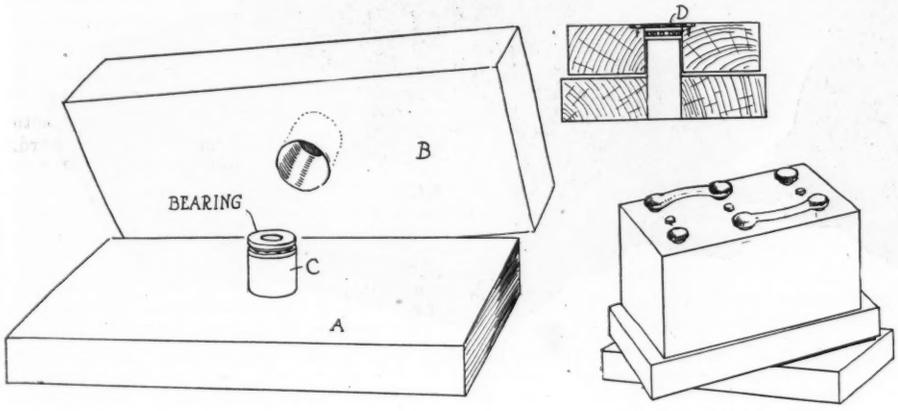


Fig. 12—Shaft in static balance. Centrifugal force on one arm is equal and opposite to the other

The Motor Car Repair Shop



An easily-made battery turntable. A ball thrust bearing on top of the tube makes for easy manipulation

Loss of Engine Power

AT some time or other in an engine's career there comes a case when some of the power it formerly developed seems to have left it. When this takes place the owner should check up on four items, the valves, ignition, carburetion and compression.

The first of these, valve action, is one of the most important. If this part of the powerplant is deranged it usually results from wear in the tappets or the space between the tappets and valve stems is too large or too small. Generally, it is too large. This means that the valves open too late and in turn the cylinders do not take in a sufficient charge. Of course, if the engine has been down and the valves retimed, there is a possibility that the timing is incorrect.

If the ignition is at fault it may be caused by a spark that is of insufficient intensity to properly set fire to the charge, or this spark may take place at the wrong time. The spark plugs should be examined for leakage, although this is not always of so great importance. Sometimes weak magneto magnets are responsible for a mysterious loss of power. If there is a battery system of ignition, the timer should come under suspicion. The roller may be unduly worn, or the race in runs in may be rough and pitted. If there is a vibrating system on the car, the vibrators may need adjustment. Never let the high-tension wires come into contact with each other. Static action may result and this is one of the hardest things to trace. All cables should be at least ½ in. apart.

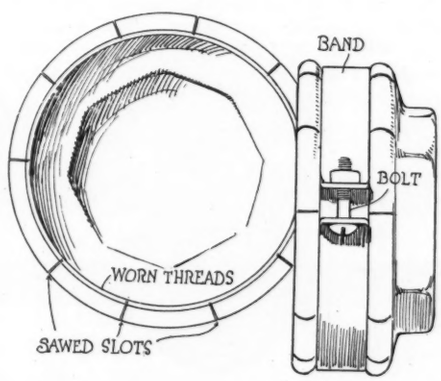
Obviously there will be a loss of power if the mixture from the carbureter is not correct. An over-rich mixture will cause an engine to overheat, give rise to preignition and incidentally loss of power. A weak mixture starves the cylinders and the engine will not perform up to its full power. Too rich a mixture is indicated when the engine lopes or gallops, as though it were controlled by a governor. More air is needed.

Loss of compression may be due to a variety of causes, the cylinders may be worn out of round, scored or even cracked. Sometimes the rings become gummed up and stick in their grooves. Faulty compression is caused also by the valves not seating properly. This means they must be ground in or refaced with a refacing tool. Weak valve springs are sometimes responsible for a falling off in power.

Loss of power is also due to a clogged muffler, or the oiling system may fail to supply the necessary amount of oil. Also the oil may be too thin. Look out for dragging brakes or a slipping clutch. All these things absorb power.

Keeping on Hub Caps

Richey, Mont., Editor MOTOR AGE—It happens sometimes that the hub caps on a motor car fit rather loosely, owing to the threads becoming worn. This can be remedied by clamping the hubs in a vise and with a hacksaw cutting several slots, as shown in the illustration. A sheet metal band then is put around the hub and fitted with two ears, in much the same manner as hose connections. When the bolt is tightened the effect is to clamp the hub cap firmly in place, as some of the looseness is taken up by the saw cuts.—Joseph H. Jacobs.



How reader takes up looseness in hub caps and prevents their coming off

Speedometer Care

Failure of the speedometer to register, may be due to breakage of the flexible shaft, deranged driving means, or sharp bends in the shaft. The latter should be guarded against by seeing that the shaft is properly supported at intervals, especially if the instrument is driven off the front wheel. So far as possible the shaft should be installed with one graceful bend from the meter to the driving means, although a slight lateral bend to the wheel is permissible. The shaft should be lubricated each season. This can be done by removing it and letting it hang in a vertical position while the special lubricant intended for it is poured into the top of the housing. Avoid running the shaft close to the exhaust pipe, as the heat sometimes thins the lubricant.

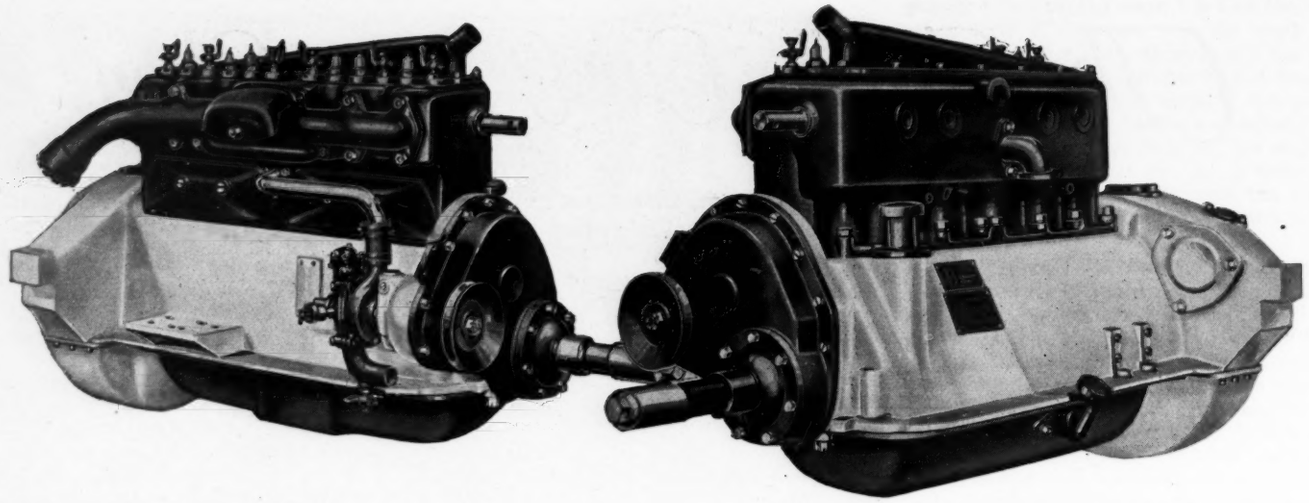
Should anything go wrong with the interior mechanism of the meter itself, do not take the latter apart. The inside of a speedometer is as complicated for the average person as a watch and unless you are thoroughly familiar with such mechanism, take it to a service station or send it back to the maker for adjustment.

Storage Battery Turntable

Every repairman who has occasion to handle storage batteries frequently knows how difficult it is to manipulate them on the work bench. A battery by nature of its construction is heavy and one of the handiest things the shop, or the car owner for that matter, can have is a battery turntable. This makes it possible to shift the battery around to whatever position desired and without any effort on the part of the operator.

The turntable is easy to make and requires simply two pieces of hardwood, small metal plate, a piece of steel tubing or pipe and a small thrust bearing. The base A should be made about 12 in. long, 2 in. thick and 5 or 6 in. wide. Oak or maple will be suitable for the material. The part B can be made of the same size or slightly smaller.

The piece of tubing C should be about 1½ in. in diameter and 3¼ in. long. Bore a hole in the center of A so the tube can be driven into it with a good driving fit. File the top of the tube perfectly square and drive it into A so it is flush with the bottom. Bore a corresponding hole in B and chisel out the top for the plate D. The latter need be only about 3 in. square and ⅛ in. thick. Drill four holes in the plate and countersink them for flatheaded brass screws. When this is in place all there is left to do is put the ball thrust bearing on top of the tube and slip B over it. The bearing makes it very easy to turn the battery around, which must be resorted to when cleaning, painting or repairing one.



Exhaust side of Continental, left, showing hot-air stove surrounding exhaust manifold and intake side, right, showing carbureter attachment

Refinements Mark Continental 9N

Longer Pistons, Hot-Spot Intake Manifold and Heavier Crankshaft

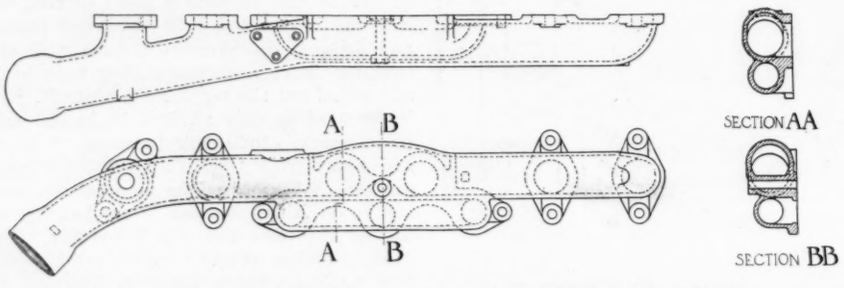
THE 9N Continental engine, which is made by the Continental Motors Corp., Detroit, succeeds the 7N and is similar to it except in new refinements. The 9N has longer pistons, a hot-spot intake manifold and heavier crankshaft. A portion of the intake is integral with the exhaust, giving the hot-spot feature which has been found beneficial in shortening the warming period with present-day fuel and which also aids in the evaporation of the heavier particles of the fuel. As in 7N the manifold crosses over between the cylinders. In addition it receives the direct heat due to its contact with the thin wall of the exhaust manifold. The engine has a bore and stroke 3½ by 5¼ and develops 31 hp. at 1000 r.p.m.; 55 at 2000 r.p.m. The S. A. E. rating is 29.40.

The crankshaft is heavier, particularly as regards the crankpin. To compensate for this the cheeks of the cranks are also heavier.

The engine has a displacement of 303.06 cu. in. and was designed to meet the demands for an engine of medium power output and particularly adapted to the needs of the assembled car makers, being standard in every respect as regards accessories, clutch and transmission attachments. The six cylinders are cast in block. The water-jacket head is cast separately, being retained by screws. The aluminum crankcase and oil pan are separate, with pressed-steel oil pan. The bearings are carried in the crankcase and can be reached by dropping the oil pan. The valves are actuated in accordance with L-head practice, being inclosed and all of the same size, both for inlet and exhaust. The valve stem locking device used on this engine is similar to that on the other Continentals, being readily detached. The removable metal plates which cover the valves also are quickly detached and act as a dust-proof housing, as well as eliminating noise.

The pistons are gray iron ground to size and fitted with three diagonally-split concentric expansion rings. These rings are ground on both face and sides. Oil grooves are turned on the outside of the piston for collecting and distributing the oil splash. The pistons are weighted and balanced.

The piston pin is of annealed steel tubing, hardened and ground to size. It is held stationary in the piston bosses by a locking device and has its bearing in a bronze bushing which is pressed into the connecting rod. Lubrication of this point is obtained through an opening in the upper end of the connecting rod in which oil from the splash is trapped. The connecting rods are of I-beam construction. Connecting rod caps are held in place by nickel steel bolts secured by a locking device.



Drawing of intake manifold, showing gas passages in Continental 9N engine

The camshaft is drop-forged with integral cams. This shaft is carried in white bronze bearings, lubricated by oil forced to them by the oil pump. One of the points regarding maintenance of this Continental engine is the fact that the camshaft readily may be withdrawn by removing the gearcase cover. The camshaft acts directly on mushroom type followers, with heads and stems ground to size.

One of the differences between this engine and the 7N is in the more careful balancing of the crankshaft, due to new methods by which the crankshaft revolves at high speed by an air blast. The material for the shaft has a tensile strength of 80,000 lb. per square inch. It is a drop-forged unit heat-treated, with flanges on both ends to take end thrusts which may be imparted from the clutch or from any other outside mechanism.

The timing gears are cut helically. The crankshaft, camshaft and pumpshaft gear are housed in the usual case on the front of the engine.

The bearing work is such that the maintenance is a simple proposition. The crankshaft, camshaft and connecting rod bearings are of nickel babbitt. Connecting rod and crankshaft bearings are backed with bronze, which being a good conductor aids materially in keeping the bearings cool. These are held in place by brass retaining screws. The connecting rod bearing adjustment is secured in the usual manner by removing one or more shims. The flywheel is attached to the crankshaft on the drop-forged flange, held in place by six bolts. It is made of iron, carefully turned and balanced.

Water circulation is by centrifugal pump, fitted on the engine and provided with two large bearings fitted with stuffing boxes and equipped with a drain cock to draw off the water in freezing weather.

Lubrication is by combination force-feed and splash system in which circulation is

maintained by a horizontal plunger pump driven by an eccentric from the camshaft. This forces oil through copper tubes direct to the timing gears and all main crank and camshaft bearings. The oil then drains back into the oil pan, maintaining a proper level for lubrication of pistons, piston pins and connecting rods.

In fitting the clutch and gearset, either a cone, multiple-disk or plate clutch may be used. The clutch and transmission units specially designed for installation on this engine are manufactured by practically all transmission manufacturers. This equipment is not furnished by the Continental company.

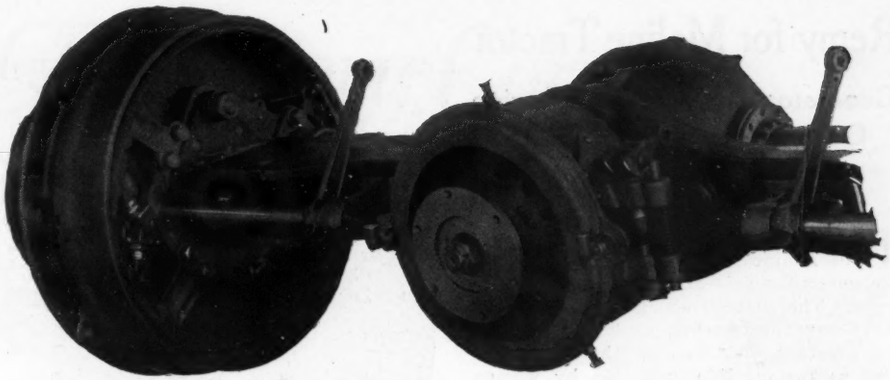
The Continental company furnishes with every engine, unless otherwise specified, water fittings complete, adjustable fan bracket, fan pulley for V-belt and spark plug wrench. Provision also is made for the application of a power tire pump. Any make of starting, lighting and ignition equipment can be used. This equipment is not included in the Continental quotation.

Torbensen 3½-ton Axle

THE 3½-ton internal-drive rear axle made by the Torbensen Axle Co., Cleveland, Ohio, carries out the fundamental principle back of the design of the Torbensen products of lighter capacity and has additional features, particularly in the form of a propeller shaft brake mounted on the drive pinion shaft. The axle is designed to carry a maximum load of 13,000 lb. on the spring pads. The axle has a reduction ratio of 10.2 to 1, a thread width of 67.5 in. and a spring center distance of 42 to 44 in. with 4-in. springs.

As is usual in Torbensen construction the load-carrying functions of the axle are taken care of by an I-beam forging which supports the entire structure. This forging has a boss in the center which is pierced to allow the mounting of the transmission members. In the case of the 3½-ton axle, the differential housing is bolted to the I-beam in a circle around the hole in the I-beam, and the rear end of the propeller shaft bolts against a flange on the pinion shaft which supports, by a taper connection, the brake drum. This brake assembly is mounted forward of the I-beam and the differential assembly, and the live axle is behind the I-beam forging.

The drive is transmitted through the pinion shaft brake flange by a bolted connection through six $\frac{25}{64}$-in. holes, equally spaced. The pinion shaft is carried on two sets of roller bearings.



Mechanism for operating expanding hub brake on Torbensen 3½-ton axle

The propeller shaft brake mounted as described, on the front end of the pinion shaft, has a diameter of 10 in. It is a contracting type with the operating mechanism supported by two brackets bolted to the axle forging. The linkage for operating the brake is connected with a cam lever, which serves as a contracting means for engaging the brake.

The live axle is contained in two drawn steel tubes which bolt against the differential housing, carrying the internal-drive pinion in accordance with usual Torbensen practice. The differential is an M. & S. The differential ends of the driveshafts are carried on Bock roller bearings and the exterior, or wheel, ends are carried on a double row of SKF No. 1310 annular ball bearings. The axle shaft diameter is $1\frac{15}{16}$ and the axle spindle diameter is $3\frac{3}{16}$ in. The brakes on the wheel hubs are 19 in. in diameter and are internal expanding, actuated by a cam and toggle arrangement in which the action of the cam expands the toggle, in turn expanding the shoes against the internal face of the drum.

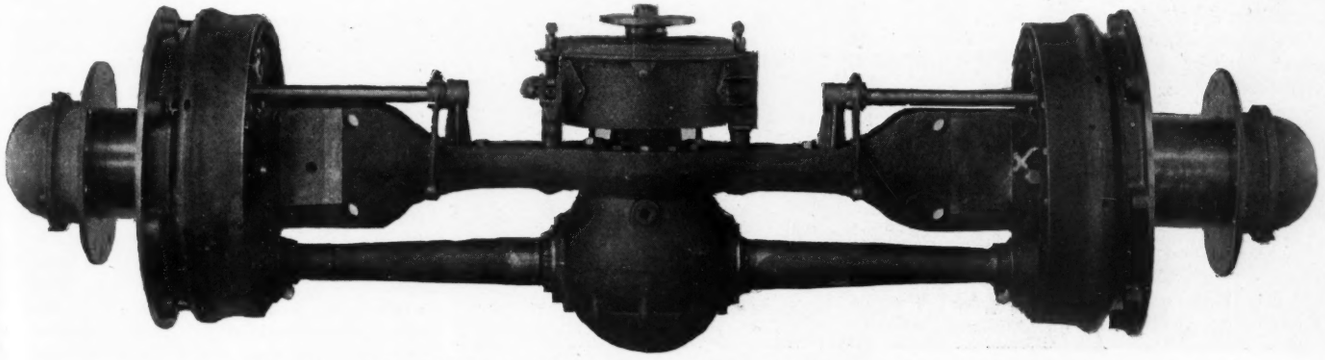
The axle is adapted for either steel or wood wheels. The spokes with the steel wheels are 3½ in. wide and with the wood wheels, 3 in.

GROCER SELLS CARS TOO

Champaign, Ill., April 19—One of the most successful motor car dealers and salesmen of Illinois is a grocer. B. C. Nelson of Champaign combines the two lines with versatility. His father founded the grocery business and he and his brother inherited it and have been operating it jointly since the death of the parent. Two years ago B. C. Nelson decided that he needed a passenger car. He was interested in a car not represented in Champaign. It was suggested to him that he take the agency and thus get his own car at the wholesale rate, while he might sell one or two more at profit enough to pay for his own. He decided to adopt this idea. It has been his custom to take orders from grocery patrons over the telephone. This has given him a leverage in boosting the sale of cars. He suggests a demonstration in the afternoon when his grocery duties are practically over for the day and when the housewife has some leisure. By this he has interested seventy-five women of Champaign in Milburn electrics in the last eighteen months and has that number of sales to his credit. He also has the agency for the Chandler car and has sold an even greater number of the gasoline car. He has the rear of his store fitted up for the display of his cars and also for a service station. He personally looks after service and sees to it that his patrons are satisfied that the confidence they placed in him is left unshaken. Nine-tenths of his sales are credited to the telephone and inquiries concerning groceries. Nelson has the knack of introducing the subject of a gasoline car or electric after putting down the order and secures the favorable attention of many persons who had not given the subject of a car any thought.

RECEIVER'S SALE OF ROSS

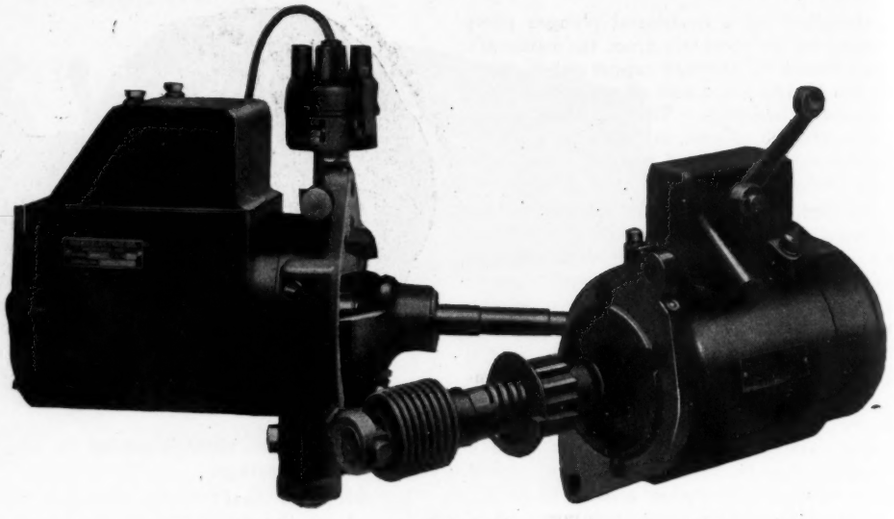
Chicago, April 19—The entire stock and equipment of the Ross Motor Car Co., Detroit, has been ordered sold May 14 by B. F. Evers, receiver. The inventory value is given as $150,000, and the sale will be conducted in Detroit by Samuel L. Winternitz & Co., Chicago autioneers.



Plan view of the 3½-ton Torbensen axle, showing brake mounted on pinion shaft

Remy for Moline Tractor

Generator Acts Also as Engine Governor in Starting-Lighting System



Remy ignition generator, left, and starting motor, right

THE Remy starting lighting system for the Moline tractor is designed so that the generator acts also as an engine governor. The system, which is a product of the Remy Electric Co., Anderson, Ind., is for constant operation of the tractor as well as for possible operation by women and boys unable to crank the engine. The generator can be so arranged as to provide settings of the governor for the various kinds of work and loads on farm practice. A departure from ordinary generator practice is found. In the Moline Plow equipment this principle is utilized by having the stationary, or field, magnet member supported rotably but the tendency to rotation resisted by a spring of predetermined pressure.

The field magnet remains in its normal position until the speed of rotation has increased to such an extent that the amount of magnetism in that field, interacting with the speed of rotation, absorbs mechanical energy by producing electrical energy, until the rotative tendency shall overcome the pressure of the spring, in which case the rotably mounted field magnet will start to rotate in the same direction as the armature. This frame is so connected to the throttle of the engine that any angular motion in the same direction as the armature will tend to close the throttle of the engine, and thereby decrease the amount of power which the engine can produce. The rotation of the field magneto, therefore, continues until the supply of fuel to the engine has been decreased to the point that acceleration of the engine is discontinued.

If a different speed of the engine is desired, it is necessary to change the amount of magnetism in the field magnet. This is done by inserting or removing resistance from the circuit containing the field windings, thereby altering the amount of magnetizing current supplied to this field. With a changed value of field current, the relation between the strength of the magnetism and the speed of rotation is no longer that which will cause the evolution of electrical energy, and the absorption of mechanical energy just sufficient for the rotative tendency of the field magnet to balance exactly the pressure of the spring, so that either the spring will cause a retrograd movement of the field magnet, thereby admitting more fuel to the engine and increasing its speed, or the increased rotative tendency will overcome the resistance of the spring, diminishing the supply of fuel to the engine and decreasing its speed.

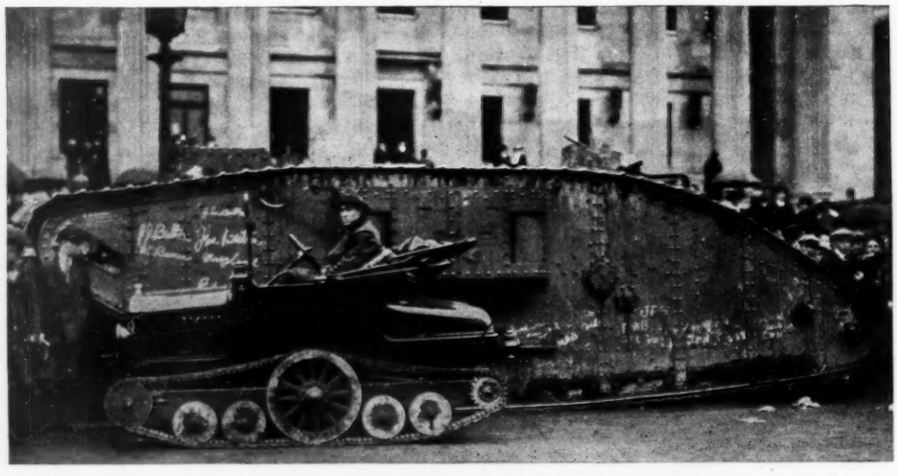
The former condition will take place if the amount of resistance in the field winding circuit has been increased, and the latter if it has been decreased. This increase or decrease in resistance in the field circuit is accomplished by an adjustable rheostat, which constitutes the entire speed adjustment of the installation. The rheostat and generator are of such dimensions that with the rheostat resistance entirely eliminated from the field winding circuit the spring pressure will be balanced by the field rotative tendency at about 500 r.p.m., and with all the resistance of the adjustable rheostat included in the field wire circuit, the pressure of the spring will balance the rotative tendency of the field magneto at about 1500 r.p.m. In both cases, these speeds are revolutions per minute of the engine and not of the generator.

The generator is a simple shunt-wound type. A ⅜-in. extension is brought out through the generator case, to which a lever is attached. This lever is connected by a simple link to the carbureter lever.

The spring in the dash spot cylinder is so arranged that the generator body is caused to rotate in the direction opposite to the armature rotation, which is clockwise in design when looking at the drive end, and the connection of the lever to the throttle is so made that the throttle is open when at rest and the spring has rotated the generator body on its trunnion bearing to this position.

When the engine is started and the generator commences to generate current, there is a magnetic drag on the field, which is carried in the generator body and which at a generator speed of 600 r.p.m. is suffi-

(*Concluded on page 45*)



The Ford "two-man tank" retains all the Ford chassis except the running gear

Ford Two-Manner

A MODEL of what is said to be the Ford two-man tank, with the exception of the armor it is to wear, was exhibited at Springfield, Mass., recently. Work on the tank has been progressing for some time under the supervision of C. H. Martin of the Martin Rocking Fifth Wheel Co., its inventor, and it is understood that three machines are now being constructed for the Ordnance Department and Quartermaster Corps and will be tested by these divisions.

Neither armor nor armament is shown and it is understood that details have not been decided as yet. It is likely, however, that the tank when in fighting trim will carry about 1200 lb. of armor and two machine guns. It is to be manned by two men and its speed will be about 12 m.p.h. on smooth going, and slightly less on rough going.

In construction, all the essential elements of the Ford chassis are retained with the exception of the running gear. In place of wheels there are two endless belts running over a series of idler pulleys and driven through sprockets which in turn are driven off the Ford rear axle. The method of steering and other details are not disclosed.

The Accessory Corner

Air Compressor

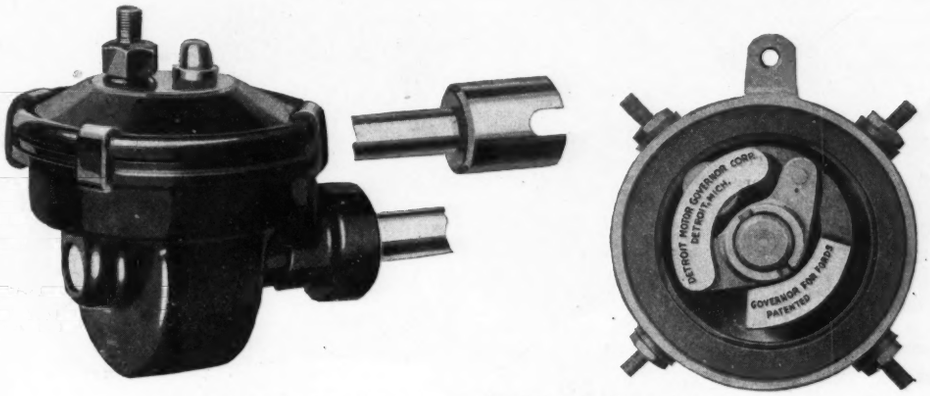
THE Faultless air compressor is a single-cylinder air-cooled pump. From 1 to 2 hp. is required to operate it, depending on the speed and air pressure. Pressure as high as 300 lb. per square inch can be developed with safety, and a constant pressure of 200 lb. can be maintained without overheating, it is claimed. The capacity of the compressor is about 5 cu. ft. of free air at 300 r.p.m. and more than 6½ cu. ft. at 400 r.p.m. The speed should be about 300 r.p.m. for constant running, though a speed of 400 for short intervals is safe. Connecting rod, bearings and bushings are of bronze, while the rest is of close-grained iron. The crankcase is inclosed and dust-proof. Lubrication is by splash from oil in the base, eliminating all grease and oil cups. Bore and stroke are 3 by 4 in. The height is 23 in., and the compressor takes up floor space 15 by 19 in., with a capacity of from 4 to 7 ft. of free air a minute. It weighs 130 lb. Price, $32.—Faultless Engine Co., Kansas City, Mo.

Governor for Ford

The Detroit governor is designed for the Ford engine when used with truck or tractor attachments. It takes the place of the roller, or brush, in the Ford timer case, performing the functions of the brush and a speed regulator. The device is said not to alter the mechanism in the slightest, automatically cutting out the distributer by centrifugal action if the engine is running in excess of from 1400 to 1600 r.p.m. When the engine is slowed down the governor releases the brush and it starts back to work again automatically. Price, $5.—Detroit Motor Governor Corp., Detroit.

Crankshaft Pump

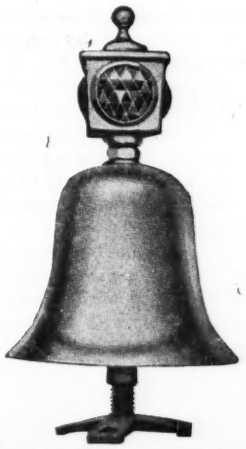
The new model G Taylor crankshaft pump is a smaller edition of the crankshaft pump which the company has had on the market for several years. The pump is of practically the same capacity, drives from the end of the crankshaft and is held in position by a bearing at the crank handle hole, also being supported by a spring grip which fastens to the cross member of the frame. Price, $7.15 east of the Rockies and $7.65 west of the Rockies, Taylor Mfg. Co., Redford, Mich.



Taylor new model crankshaft pump, left, and Detroit governor for Fords

Bell Radiator Emblem

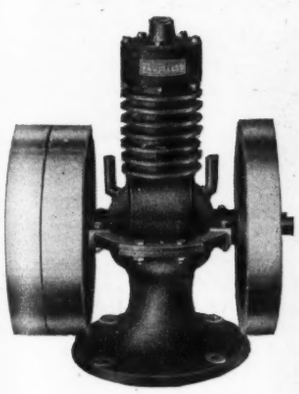
In this day of the Liberty Bond issue the Liberty Bell radiator emblem is both patriotic and ornamental. The bell gives warning and in addition a bright red light flashes through prismatic lenses when the bell rings. Three models are offered in three sizes each. On all the models having light, the lamp is in circuit with the bell so the light flashes only when the bell rings. All electrical parts are protected fully against dampness, dust and injury. Operation is by a push button convenient to the driver. Bell and light together use only about a fifth the current necessary to operate a horn, it is claimed. Prices, from $6 for the smallest size of plain bell to $14 for the largest size of bell with light.—Liberty Bell Co., Cleveland, Ohio.

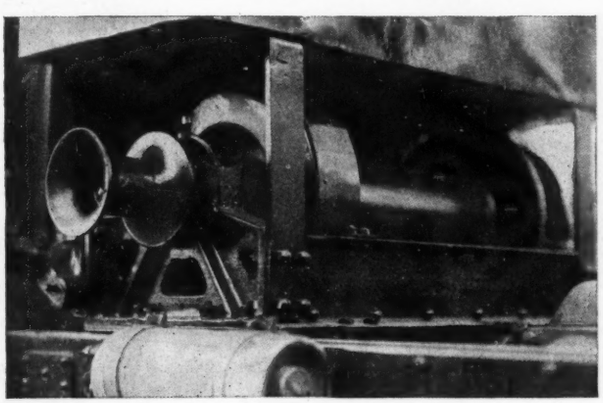


Liberty Bell emblem with lamp

Fyr-Fyter

The Fyr-Fyter is a chemical extinguisher which consists of a strongly-built cylindrical brass reservoir inside of which is mounted a high-efficiency, manually-operated air pump and a pick-up mechanism that insures the discharge of the liquid contents in whatever position the pump may be held. Beginning with the first stroke a continuous stream will be discharged 25 ft., increasing with successive strokes to more than 30 ft. The fluid in the extinguisher consists of a compound of chemicals free from acids, alkalis, moisture or other injurious ingredients, it is claimed. It is a non-conductor of electricity and is designed to extinguish electrical short-circuits as well as incipient fires of all classes. The device is approved by the Underwriters' Laboratory, Inc.—Fyr-Fyter Co., 231 Insurance Exchange building, Chicago.





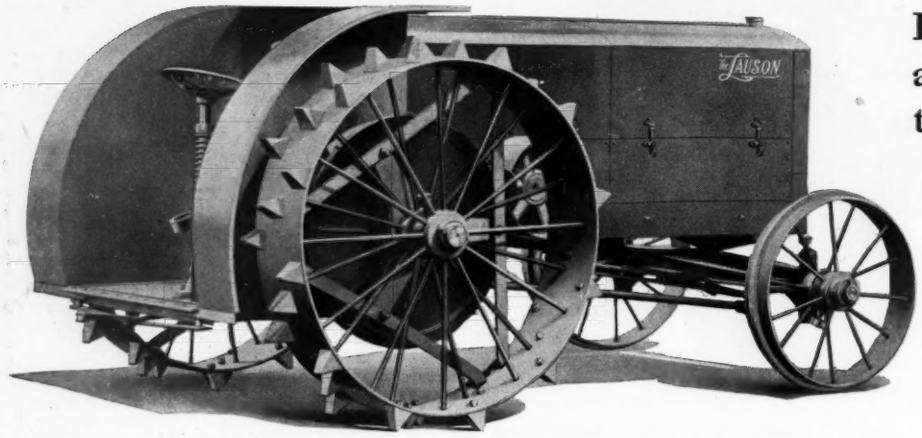
Faultless air compressor, left, and Duplex power winch, right

DUPLEX POWER WINCH

The Duplex Truck Co., Lansing, Mich., is installing on its four-wheel-drive truck, as special equipment a power winch of 10-ton capacity. The winch is operated from the gearset by a worm-and-worm wheel. The drive for the winch is inclosed in a case providing a continuous oil bath. The drum is carried on special main bearing preventing any disalignment due to the distortions of the frame, and the gear reduction is such that the rope speed is about 50 ft. per minute at an engine speed of 1000 r.p.m. Power is transmitted to the drum by a friction cone designed to handle a maximum of 10,000 lb. which is controlled from the driver's seat by a hand lever. The winch is located under the driver's seat and thus utilizes none of the load-carrying space. The winch is adaptable to hoisting or moving heavy articles of any kind.

Accessibility Features Lauson

Bearings on Every Shaft and Dust-proof Construction in New Model Tractor



Lauson Full-Jeweled 15-25 tractor, showing motor car-type hood covering all working parts

THE outstanding features of the new Lauson Full-Jeweled kerosene tractor, manufactured by the John Lauson Mfg. Co. New Holstein, Wis., are unit assembly all the way through so that any part can be reached without disturbing any other part; anti-friction Hyatt or Timken bearings on every shaft; dust-proof construction extending to the bull gear and the bull pinion, which are inclosed in a dust-proof housing and run in oil; and special adaptability for belt work.

The new model Lauson tractor is of the four-wheel type, is rated at 15 hp. on the drawbar and 25 hp. on the belt, although the engine will develop at least 20 per cent greater power as a reserve for emergency use. It weighs 5550 lb. without fuel, water, oil and lugs, distributed two-thirds on the drive wheels and a third on the steering wheels. It has a plowing speed of 2½ m.p.h., a low emergency of 1¾ m.p.h., and a reverse. It will pull three 14-in. bottom plows under average conditions and four under favorable conditions and has belt power capacity for the largest-sized silo filler or a grain separator up to 30-in. cylinder. The price is $1,800.

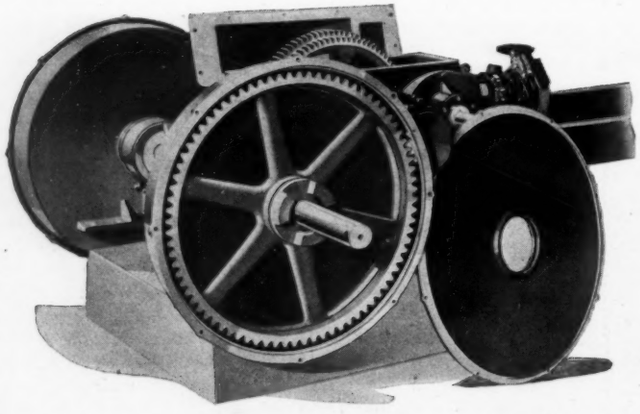
Unit assembly and accessibility of parts are emphasized in the construction. Beginning with the flexible Clark universal coupling between engine and transmission, so that either may be reached without interference with the other, the principle of accessible unit construction is maintained throughout. Simplicity of construction also is a feature, particularly in the transmission, where gears have been reduced to a minimum. Herein the unit construction prevents the possibility of spreading in the differential unit, as the secondary drive and the compensating gears constitute a complete unit and are an integral part of the transmission. The bull pinion shaft is splined so that it can be drawn out, making the differential unit removable. The cylinder head of the engine is readily removable, giving ready access to the cylinders and facilitating the grinding in of valves. The lower half of the crankbe removed, giving easy access to the crank bearings.

Hyatt and Timken bearings are used, giving forth the name Full-Jeweled. The rear axle is equipped with heavy-duty Hyatt roller bearings, while the front wheels are supplied with dust-proof hubs and Timken roller bearings. All shafts in the transmission, as shown in the illustration, have Hyatt roller bearings, and the fly-ball governor is mounted on ball bearings. The connecting rod bearings are brass backed and asbestified and have four bolts, insuring rigidity and providing a wider margin of safety.

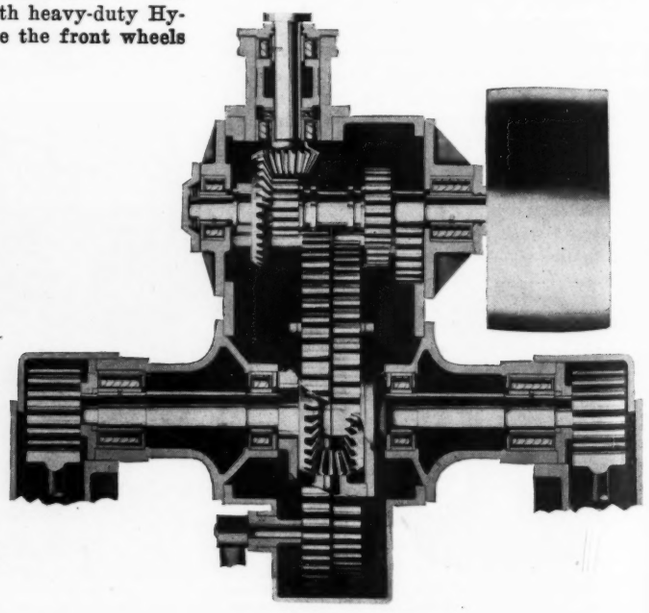
Working Parts Protected

All working parts are protected thoroughly against dust and dirt. The crankcase and the transmission case are dirt and dust-proof, and the bull pinion and bull gear are inclosed in a dust-proof case with felt ring joint and run in oil. As open gears usually are the first part of a tractor to wear out, and as they frequently last through one season only, this inclosing of the bull gears on the Lauson will lengthen materially the life of the tractor. The fly-ball governor, of the company's own design, is an integral part of the engine, is inclosed in a dust-proof case and also runs in oil. It is driven direct from the camshaft, obviating the necessity of a governor belt. As an additional precaution against dirt the engine, transmission case and fuel tanks all are covered with a motor car type hood. This also enabled the designer to give the machine artistic lines, something which will appeal to the taste of the average farmer.

The Lauson tractor is not merely adaptable to belt work, it was especially designed to work on the belt. When the transmission is thrown into neutral the pulley derives its power directly from the engine,



Bull pinion and bull gear on Lauson tractor inclosed in dust-proof case and running in oil



Transmission, differential, bull pinion shafts, pulley shaft and pulley, Lauson tractor, right

and thus practically the whole power of the engine is transmitted to the belt.

Lubrication is by pump which automatically oils all bearings and gears, including the governor and cam bearings. Oil is forced into the crankshaft bearings by the pump under 30 lb. pressure through ducts bored in the cheeks of the crankshaft. This force-feed lubrication system is supplemented by the ordinary splash system.

Gears are of hardened chrome nickel steel. Bull pinions are of steel and bull gears of semi-steel, all machine cut. The bull gear has a 3½-in. face.

The drawbar hitch is of standard height, 17 in., and a stationary drawbar is used for plowing, providing the approved hitch when two wheels run in the furrow. For harrowing and other work a swinging drawbar is furnished.

Specifications of the Lauson Full-Jeweled tractor are as follows:

Engine—Lauson-Beaver, four-cylinder, 4½ by 6, valve-in-head.
Ignition—Sumpter-Dixie high-tension magneto with impulse starter.
Carbureter—Kingston, with Bennett air cleaner as present standard equipment.
Radiator—Perfex honeycomb type, extra large.
Clutch—Internal expansion type with compensating yoke, controlled by operator from seat.
Control—From spacious back platform, where operator has everything within easy reach.
Transmission—Selective sliding gear type.
Pulley—Diameter, 18 in.; face, 8 in.; speed, 475 r.p.m.
Wheels—Drivers, diameter, 54 in.; face, 12 in.; front, diameter, 32 in.; face, 6 in.
Wheelbase, 86 in.; length, over all, 136 in.; width, 74 in.; height, 62 in.; tread, 52 in.; road clearance, 11½ in.; drawbar height, 17 in. Turning radius, 20 ft. Capacity of fuel tanks, 13½ gal. for both gasoline and kerosene.

REMY FOR MOLINE TRACTOR

(*Concluded from page 42*)

cient to overcome this spring, causing the generator body to rotate in the same direction as the armature and throws the throttle sufficiently to maintain this predetermined speed. There is a minimum speed regulation of 600 r.p.m. of the generator, for it is presupposed that the generator will be driven at one and one-half times engine speed; therefore, the low governing speed would be 400 r.p.m. of the engine.

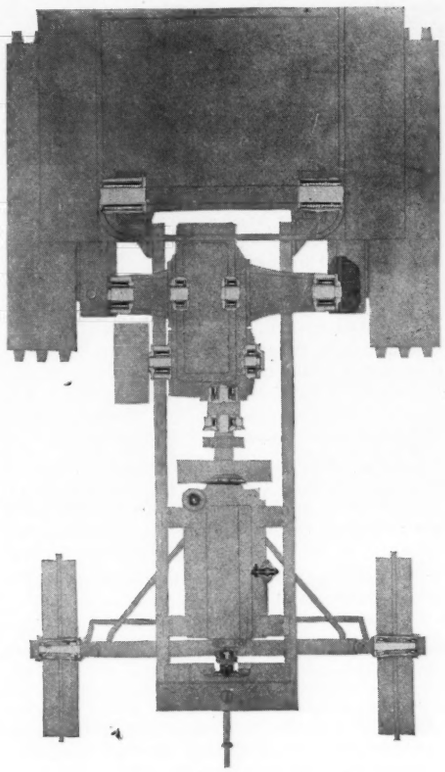
If the engine is to operate at 800 r.p.m. by the use of an adjustable shunt field, thereby making it weaker, and, in turn, the magnetic drag between the armature and the field is less than the strength of the spring when the generator body is caused to rotate in a counter-clockwise direction, thereby opening the throttle, a sufficient number of magnetic lines of force are cut by the armature coil to germinate enough magnetic drag to overcome the spring again, the throttle is closed and the engine is governed at the increased speed.

Governing the Engine

If, on account of an increased load, the engine slows down slightly, the voltage and magnetic drag drops down, becoming less than the strength of the spring which opens the throttle, maintaining the desired governed speed. If the load is made less and the engine speeds up a few revolutions per minute there is an increased voltage and current output and a resultant increase in magnetic drag; therefore, the spring is overcome by the magnetic drag and the throttle is closed. In other words, to make the engine faster you must make the field weaker. The result is, in the act of governing the current output is adjusted automatically and is at all operating speeds a predetermined current output of approximately 6 amp. Of this 1½ are utilized for ignition, while 4½ amp. continually are going into the battery.

The starting switch is mounted on top of the motor and is provided with tunnels to take the end of the ½-in. steel conduit through which the starter cable is run. It is of the lever-and-shaft type.

The generator is inclosed in a cast-iron case, with a large inspection hole open at the top, which is provided with a pressed steel cover with extremely wide flanges and drawn down by two bolts centrally located, thus assuring a dust- and watertight joint where it makes up with the generator case. In the ignition distrbutor, the principles of the Remy battery ignition design have been followed closely.

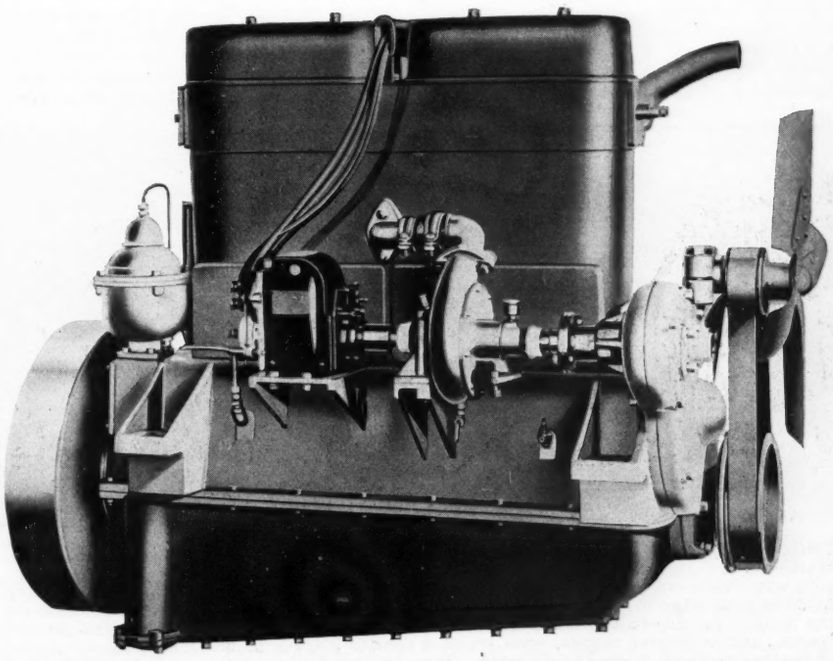


Location of Hyatt and Timken roller bearings on Lauson Full-Jeweled tractor

CANADIAN EMBARGO AWAITED

Detroit, April 19—What effect the proposed Canadian embargo on motor cars will have on the local industries is not known. All the plants are rushing cars into the Dominion as fast as they can to stock the dealers before the bill becomes effective. If the bill goes through many of the manufacturers who wish to preserve the Canadian trade will establish assembling plants across the border, provided the cost is not too great in proportion to the business. Those whose Canadian business is only a small percentage of their total sales will not worry about the embargo and will confine their efforts to domestic demands.

The proposed bill has stimulated buying by Canadian dealers, and most of them already have a supply of cars to carry them for a long time. It is reported that in the neighborhood of 5000 cars are stored in Windsor awaiting disposition to other canadian points. Although the Cadillac Motor Car Co. dislikes to go out of the Canadian field it is hesitating to establish an assembly plant there. Many of the other manufacturers feel the same about the matter. The bill as it is understood here provides for a total embargo or 10 per cent increase of duty. In either event the importation of cars will be shut off.



Engine in Lauson tractor, showing simplicity of construction, automatically oiled flyball governor and removable plate on bottom of crankcase

Among the Makers and Dealers

MAIRE Heads King Branch—A. W. Maire has been appointed manager of the Cleveland, Ohio, branch of King Motor Car Co., Detroit.

New Building for Screw Products—The Automobile Screw Products Co., Cleveland, Ohio, is erecting a one-story factory building, 90 by 120 ft. The company also has bought land 100 by 300 ft.

Bergie Opens New York Branch—The Bergie National Spark Plug Co. has opened an eastern sales branch in New York. R. M. Hodes, the company's eastern territory manager, is in charge.

Shelby Tractor & Truck in Production—The Shelby Tractor & Truck Co., Shelby, Ohio, formerly the Standard Mfg. Co., has started production on a ¾-ton truck and a two-plow tractor. The company has been experimenting and developing these models for two years.

Fletcher in Larger Plant Now—L. V. Fletcher & Co., Long Island, City, N. Y., have expanded their factory facilities by moving into the plant of the Neptune Meter Co. The Fletcher carbureter will be made in this plant complete in every process from the rough casting to the finished product. The capacity is more than 2,500 carbureters a day.

Gearshift Company Awards Contracts—The United States Auto Gearshift Co., Eau Claire, Wis., has awarded contracts for the erection of the first unit of its new plant, foundations for which have just been completed. Work on the superstructure will begin at once and probably will be completed by June 1. In the meantime the company is manufacturing the hydraulic gearshifting device under contract with the Eau Claire Mfg. Co.

Reliance Building Nears Completion—The Reliance Motor Truck Co., formerly the Racine Motor Truck Co., Racine, Wis., has completed reorganization to provide representation for new capital entering the concern since its removal to Appleton, Wis., where a large factory is now nearing completion. Ira L. Miller continues as president and general manager. A. K. Ellis has been elected vice-president; Thomas M. Purtell, secretary-treasurer. The new plant, which will cost about $100,000 complete, is expected to be under roof by May 1, and actual production will commence June 1. The company has been manufacturing trucks in Racine for several years.

New Era Gets War Order—The New Era Spring & Specialty Co., Grand Rapids, Mich., has received an order from the Government for 1,000 tire carriers to be used on Dodge Brothers ambulances for foreign service.

Standard Crucible Steel Adds—The Standard Crucible Steel Co., Milwaukee, Wis., is erecting a foundry addition, 40 by 50 ft., to increase its casting production to the point required by unfilled orders. The additional facilities will be available about May 15.

Gillette Rubber Is Building—The Gillette Rubber Co., Eau Claire, Wis., manufacturer of the Gillette safety tire, is erecting a two-story stockroom, warehouse and shipping building, 65 by 150 ft., costing $35,000. Work is now under way and the building is to be ready about June 1.

French Now With Advertisers—Brooke, Smith & French, Inc., is the name of the advertising agency formerly known as Brooke, Smith & Moore. This change is made in recognition of Willard S. French, who joined the organization recently. Mr. French was formerly sales dirctor of the Monarch Governor Co. of Detroit.

Studebaker Makes Branch Changes—George N. Jordan, for some years manager of the New England wholesale branch of the Studebaker Corp. at Boston, Mass., has gone to Providence, R. I., where he will handle the Rhode Island business for the company. Henry T. Myers, who was in charge of the commercial department at the factory, succeeds him.

Haynes Insures Its Employees—The Haynes Auotomobile Co., Kokomo, Ind., has taken out a blanket insurance policy on the lives of all employees who have been in the service of the company six months or more. The policy, which calls for the payment of insurance in the sum of more than $500,000, is being carried by the company without cost to the men. Every employee who has been with the company for six months has been presented with a policy for $500. The sum of $600 in insurance is carried on the life of each employee who has been with the company for one year, and for each additional year of service $100 is added to this amount until the maximum of $1,500 is reached. The insurance became effective April 1.

A. H. McIntyre Leaves Saxon for Paige—A. H. McIntyre, for the last few years in charge of the wholesale department of the Saxon Motor Car Co. for New England, has accepted a similar position with the Paige-Detroit Company at Boston, Mass.

Armstrong Rubber Buys Plant Site—The Armstrong Rubber Co., Inc., New York, has purchased property at Garfield, N. J., and contracts have been let for buildings. The new plant will be in operation early this fall. Tires and tubes will be manufactured.

Wisconsin Gear Will Build—The Wisconsin Gear & Axle Co., Milwaukee, Wis., a new concern organized to manufacture automotive parts, has awarded contracts for the erection of a plant at Wauwatosa. The first unit will be 50 by 150 ft. in size, one story high, of reinforced concrete, brick and steel.

Toole in New Position—John F. Toole has been appointed division sales manager of Willys-Overland in California. Mr. Toole formerly was special representative of the Willys-Knight division of Willys-Overland and later zone manager with headquarters in St. Louis. He went to the Pacific coast as a district manager a year ago.

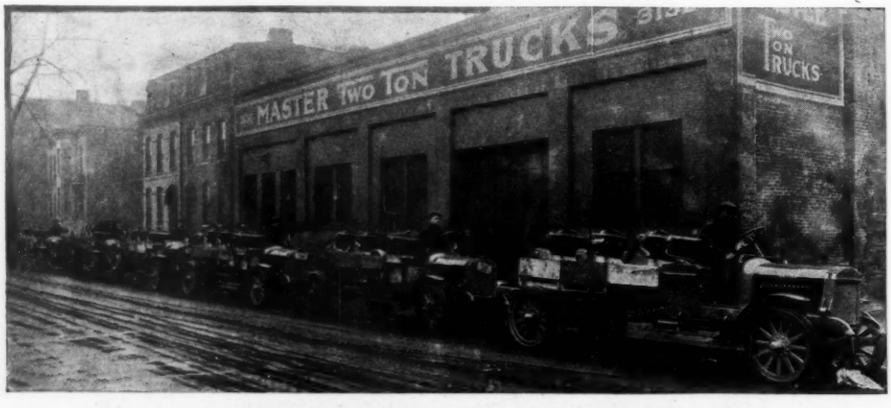
Beamer Takes on New Work—George R. Beamer, for the last twelve years connected with the United Gauge Co., of New York as Detroit representative, has added to his duties by becoming Detroit branch manager for the Federal Ball Bearing Co., Poughkeepsie, N. Y., manufacturer of the Shatz bearing.

Detterich to Manage Bearings Advertising—H. J. Detterich has been appointed advertising manager of the Bearings Service Co., Detroit. He was formerly assistant advertising manager of the Paige-Detroit Motor Car Co. and previous to that was with the advertising department of the Studebaker Corp.

Dickinson Moves Up With Hupp—Frederick Dickinson has been appointed assistant sales manager of the Hupp Motor Car Corp., succeeding H. E. Westerdale, who is leaving the Hupp organization to join the McCord Mfg. Co. Mr. Dickinson has been advertising manager of the Hupp organization for the last three years, and in his new position will continue to have charge of advertising.

Light Trucks Used for Hauling—The Graves Sales Corp., New York distributer in New York state for McNaull tires, received its first consignment of merchandise via motor truck transportation from the factory at Toledo, Ohio, March 29. The company is experimenting with a light type of car—Ford Model T 1-ton truck, equipped with pneumatic tires of the McNaull type and army stake-type bodies. The trucks carrying tires to eastern cities will bring back rubber and fabric to the factory.

Wood Wheel Makers Meet—The Automotive Wood Wheel Manufacturers' Association met in a two-day session at Philadelphia, Pa., recently. The association meets monthly in different sections of the country. Hosts for this month's meeting were the Schwarz Wheel Co., the Phineas Jones Co. and the Wayne Wheel Co. The next general meeting will be held at Detroit April 24. The officers are: President, S. Vance Lovenstein, Schwarz Wheel Co.; vice-president, A. D. Smith, Hayes Motor Truck Wheel Co.; sec-



TRUCKS IN TEST BRING BACK ENGINES—Killing two birds with one stone, Master Truck, Inc., Chicago, is combining the road test trip which every Master undergoes with relieving transportation conditions and speeding up delivery of parts. Every truck is submitted to a road test of 40 miles, and, inasmuch as it is just 20 miles from the Master factory to the Buda Co. plant at Harvey, Ill., which furnishes the powerplants used in Master trucks, each truck is sent to Harvey to bring in a capacity load of engines before it is sent to a dealer. Thus the company not only tests its trucks and keeps up its supply of engines, but relieves the railroads of that much hauling as well. Further, the plan represents a considerable saving in time over shipments made by rail

retary, C. C. Carlton, Prudden Wheel Co., and treasurer, B. L. Porter, Auto Wheel Co.

Menominee Truck in Long Drive—The Menominee Motor Truck Co., Menominee, Mich., recently started on its way a 3½-ton chassis which is being delivered under its own power to P. E. Corkran, representative of the truck in Wilmington, Del. Mr. Corkran and a driver came to Menominee to take the chassis on its 1,100-mile trip. Arrangements were made for short-haul loads between intermediate points for much of the distance. From Menominee to Milwaukee the truck carried a load of service parts for the branch house.

New York Jobbers Organizing—The jobbing interests of New York have organized the New York State Association of Automobile Accessory Jobbers as an adjunct of the National Association of Auotomobile Accessory Jobbers. The officers are: President, C. S. Owen, Chapin-Owen Co., Rochester; secretary, E. T. Ball, Joseph Strauss & Son, Buffalo; treasurer, W. J. Davis, Davis-Brown Electric Co., Ithaca. Jobbing problems effecting the territory covered will be handled, as the national association handles national problems. The next meeting will be May 15 at the Hotel Ten Eyck, Albany.

Marathon Tire Makes Addition—The Marathan Tire & Rubber Co., Cuyahoga Falls, Ohio, has completed the addition to its factory of a large molded goods and specialty department. In addition to rubber specialties it now is making heels and soles in quantities.

Automotive Supply Concern Organizes—The Auotomotive Supply Co. has been organized in Kansas City, Mo., by W. E. Smith for wholesale distribution of automotive supplies. Mr. Smith has in view the business which will develop in tractor supplies as that automotive item gets larger distribution in the territory. For several years he was special representative on bicycle tires and accessories in nine western states of the B. F. Goodrich Rubber Co. The new company has two men on the road and is preparing a catalog. It will do a wholesale business only.

WOMEN HELP MAKE DRIVEAWAY—If America needs more women to drive ambulances in France, it is certain that five competent motor car pilots will be found at Parsons, Kan. Dressed for roughing it, the five women pictured above visited the Briscoe plant at Jackson, Mich., and drove back five Briscoe cars. The man in the picture is C. E. Ervin, Briscoe dealer at Parsons. The long trip over roads, that in some places were almost impassable, was made without incident

Recent Incorporations

Detroit—Diamond Trucking Co.; capital stock, $10,000; incorporators, Charles S. Abell, Harry J. Tinney and Eugene P. Swan.

Chicago—Advance Motor Service Co.; capital stock, $6,000; incorporators, C. H. Medworth, F. J. Odenhemer and O. T. Seaholm.

Ardmore, Okla.—Master Truck Sales Corp.; capital stock, $20,000; incorporators, R. O. Dulaney, J. L. Crump and E. J. Winfrey.

Ardmore, Okla.—American Motor Co.; capital stock, $20,000; incorporators, J. W. Ball, Amos Wolfe and G. B. Wolfe.

Ardmore, Okla.—Ardmore Motor Co.; capital stock, $50,000; incorporators, B. Statler, J. C. Statler and W. A. Hensley.

Atchison, Kan.—Universal Tire Stores Co.; capital stock, $15,000; incorporators, George E. King, Mary Leniger, J. L. Fox and E. M. Hart.

Chicago—Service Motor Sales Co.; capital stock, $10,000; incorporators, R. M. Pierson, J. L. Salzman and H. L. Lund.

Chicago—Security Motor Co.; capital stock, $25,000; incorporators, C. M. Maxwell, E. M. Stepleton and P. M. Godehn.

Chicago—Washington Tire & Vulcanizing Co.; capital stock, $10,000; incorporators, A. B. Seelig, I. M. Amter and L. E. Seelig.

Cincinnati, Ohio—Central Auto Supply Co.; capital stock, $10,000; incorporators, L. W. Eiser, J. O. Smith, William Roche, A. Leussing and Arthur E. George.

Cleveland, Ohio—Pearl Motor Sales Co.; capital stock, $10,000; incorporators, D. B. Donnelly, Fred C. Evers, John W. Rebtz, R. C. MacGill and P. L. Emery.

Cleveland, Ohio—Standard Trailer Co.; capital stock, $15,000; incorporators, Robert W. Patterson, T. D. Golden, C. O. Luce, H. E. Luce and J. K. Patterson.

Cleveland, Ohio—Valley Motor Trucking Co.; capital stock, $25,000; incorporators, S. H. Holding, Tracy D. Duncan, M. H. Ordner, B. M. Parker and E. L. Heid.

Cleveland, Ohio—Ohio Trucking Co.; capital stock, $10,000; incorporators, James R. Marker, Joseph J. Rowe, John J. Joyce, Charles Schullman and C. H. Duncan.

Cleveland, Ohio—Allis Motor Sales Co.; capital stock, $10,000; incorporators, W. H. Allis, M. C. Burns, A. E. Watson, M. T. Mazanek and George T. McConnell.

Cleveland, Ohio—Cleveland Rubber Corp.; capital stock, $3,000,000; incorporators, Ole Hibner, W. I. O'Bryan, D. W. Besaw, C. B. McClintock and Grace M. Bell.

Cleveland, Ohio—Intercity Trucking Co.; capital stock, $30,000; incorporators, W. S. Blood, H. G. Russell, A. G. Davis, W. L. Joyer and G. E. Romano.

Cleveland, Ohio—National Trucking Co.; capital stock, $10,000; incorporators, James R. Marker, Joseph J. Rowe, John J. Joyce, Charles Schullman and C. H. Duncan.

Cleveland, Ohio—K. & P. Tire & Motor Service Co.; capital stock, $75,000; incorporators, Elden Joseph, J. Kroupa, Jaro Mimberger, George A. Walters, Joseph F. Mimberger, Joseph Henby and John A. Dvorak.

Cleveland, Ohio—Highways Motor Transport Co.; capital stock, $75,000; incorporators, Paul J. Bickel, John A. Smith, F. S. Whitcomb, J. C. Pettit and C. C. Owens.

Cleveland, Ohio—Columbia Body Sales Co.; capital stock, $25,000; incorporators, Joseph B. Pospeshil, J. H. McTaggert, P. M. Berry, Fred L. Bennage and Roscoe M. Ewing.

Cleveland, Ohio—Diamond T. Cleveland Truck Co.; capital stock, $20,000; incorporators, J. A. Fenner, C. L. Stocker, C. C. Young, A. M. Lovel and F. W. Stanton.

Cleveland, Ohio—Motor Distributing Co.; capital stock, $25,000; incorporators, S. E. Selby, P. T. Squire, E. E. Bates, C. E. Slater and D. J. Buckley.

Cleveland, Ohio—Breyley Automatic & Portable Car Stop Co.; capital stock, $25,000; incorporators, Frank S. Day, James U. Duffy, Henry H. Schneider, Edward W. Breyley, Charles A. Tuite and John N. Barry.

Cleveland, Ohio—Crossley Rubber Co.; capital stock, $15,000; incorporators, David A. Crossley, Charles E. Gosson, C. M. Loss, Albin S. Jacobson and E. W. Stuart.

Cleveland, Ohio—Corona Automobile School; capital stock, $15,000; incorporators, William Herschaft, Richard Simon, Allan Stefan Bzwonkowski, Stanislav Bartessek and Ignacy Jadrych.

Cleveland, Ohio—Simmons Motor Car Co.; capital stock, $50,000; incorporators, John L. Cannon, Ben B. Wickman, W. H. Boyd, B. M. Butler and H. E. Werner.

Cleveland, Ohio—Osborne Storage Battery Co.; capital stock, $10,000; incorporators, Carroll K. Osborne, Earl H. Jaynes, C. D. Mason, M. L. Hoffman and A. D. Carlton.

Cleveland, Ohio—Bunyan Signal Light Co.; capital stock, $20,000; incorporators, W. J. Bunyan, Andrew Heppl, James Heppl, Albert Beznoska and Rudolph Humpal.

Columbia, S. C.—Capital City Garage & Tire Co.; capital stock, $30,000; incorporators, W. B. Mitchell, G. R. McNeill and R. H. St. Clair.

Columbus, Ohio—B. B. Harris Tire & Rubber Co.; capital stock, $10,000; incorporators, A. S. Hetzel, Karl E. Burr, Charles A. Palmer, Sherman B. Randall and B. B. Harris.

Columbus, Ohio—Columbus Armleder Motor Truck Co.; capital stock, $30,000; incorporators, Charles H. Furman, Jacob Mattlin, Benjamin F. Levinson, Mornes Belm and August W. Weber.

Columbus, Ohio—Overland-Dunkle Co.; capital stock, $160,000; incorporators, C. T. Dunkle, C. R. Arenschield, A. C. Ogden, T. P. Pinkerton and H. G. Putman.

Crosbyton, Tex.—Highway Garage; capital stock, $6,000; incorporators, L. R. Powell, J. A. Parks and Andrew Cynora.

Detroit—Larned Tool & Die Co.; capital stock, $15,000; incorporators, William C. Weiske, Charles V. Ketts and H. J. Labean.

Detroit—International Motor Truck Co.; capital stock, $20,000; incorporators, George F. Bamlet, Isaac A. Lynch and Harry Breitmeyer.

Detroit—Pneumatic Puncture-Proof Tire Co.; capital stock, $10,000; incorporators, Julius W. Nowicki, V. E. Thompson and Moe Elrich.

East Liverpool, Ohio—Buckeye Motor Co.; capital stock, $12,000; incorporators, W. M. Litten, W. A. Hobbs, M. F. Morley, Monroe Patterson and M. L. Hague.

Edwardsville, Ill.—Giese Motor Co.; capital stock, $10,000; incorporators, O. H. Giese, G. S. Giese and A. H. Van Nahme.

Elkhart, Ind.—Pecks Super Heat Co.; capital stock, $10,000; incorporators, Raymond G. Peck, Carl E. Mischler and H. J. Rife.

Findlay, Ohio—Tacoma Garage Co.; capital stock, $15,000; incorporators, Pearl B. Rice, Marion G. Foster, Peter G. Altmyer, H. B. Hall and J. Robert Hanrahan.

Fulton, Mo.—Fulton Motor Co.; capital stock, $15,000; incorporators, N. T. Cave, J. E. Maughs, Crockett Harrison, Carl Wise, W. S. Vivion, G. C. Terry and W. W. Conner.

Gallipolis, Ohio—Kohut Rubber & Tire Co.; capital stock, $100,000; incorporators, Charles G. Clark, Paul Dye, John V. Dale, A. S. Richardson and L. Ward Crane.

Grand Rapids, Mich.—Boulevard Auto Co.; capital stock, $10,000; incorporators, Frank Noblett, V. H. Smith and Isaac J. O'Donnell.

Greenwood, S. C.—Smathers Motor Car Co.; capital stock, $10,000; incorporators, J. R. Smathers and J. P. Abney.

Hershey, Neb.—Hershey Auto Co.; capital stock, $25,000; incorporators, J. W. Abbott, O. H. Eyerly and G. W. Morgan.

Kansas City, Mo.—National Rubber Co. of New York; capital stock, $20,000; incorporators, E. R. Flasher, L. S. Harpe, William F. Fay, J. Sarfaty and E. Jagusch.

From the Four Winds

VETERANS TO TOUR UNITED STATES—W. H. Dunning and Mr. and Mrs. A. H. Dunning, whose ages aggregate 225 years, are now about to start on a motor tour of the United States in a truck built after their own ideas of convenience. The picture shows the trio in camp at Los Angeles, Cal. The Dunning men are Civil War veterans

SHOW Proceeds for Red Cross—The Savannah Auto Trade Association, Savannah, Ga., voted unanimously to give all the net proceeds of its show April 16-20 to the Savannah chapter of the Red Cross. Another feature of the exhibition was the admission of all orphan children in the city free on the 18th. School children also were admitted free one day when accompanied by their parents.

New Road Guide Ready May 1—The third edition of the complete official road guide of the Lincoln highway is being printed and will be ready for distribution to the tourists contemplating the Lincoln highway trip on or before the first of May. The book gives the entire Lincoln highway history from the time of its inception to date and is much larger than any previous edition.

Farmer Keeps Up Inclined Road—A Berlin, Conn., farmer, who collects garbage from the Hartford hotels for hog fodder, has to follow a considerable stretch of inclined roadway to his property after leaving the Berlin turnpike. While other country roads have been almost impassable this spring the incline referred to is kept in good order by dragging and harrowing. The hog producer spends 15 min. a day in going over this road and asserts that because he takes the time to do this he always had a solid dirt road to travel over with his 1-ton truck.

Traveling Anti-Waste Exhibit—To give its employees some idea of the waste in food products and manufacturing material each day the Westinghouse Electric & Mfg. Co. fitted a storage battery truck as a traveling exhibit with food and material exhibits. It is estimated that food wasted a day by the employees, at their own expense, amounts to between $35 and $40. The waste of materials amounts to hundreds of dollars a day, though a force of men assorts the scrap material so that this waste is reduced to a large extent. Above the material is a sign "Wasted," with the words "Food brought from your homes" and "Materials belonging to the company." The truck is taken up and down the aisles.

Takes Her Brother's Place in Agency—Because her brother was called to the colors, Miss Francoise Williams has stepped into her father's agency at Bloomington, Ill., and is carrying on the business in the absence of the brother. As captain of driveaway crews she has made several trips to the Willys-Overland plant for cars.

Another Job for Sherlock—When Freeholder Samuel Winterbottom, Egg Harbor, N. J., an Englishman by birth, but naturalized twenty-eight years ago, started out with his big car for a trip to the seashore, the machine burst into flames. After the fire was extinguished, Mr. Winterbottom found that waste soaked in kerosene had been stuffed in between the exhaust pipe and the body, and the heat of the exhaust had done the rest. A note in the car said: "Burn, you old English."

Wisconsin Doubles Registration Mark—More than 120,000 licenses already have been issued to private owners of Wisconsin by the department of state, a number double that of a year ago to-day. The total registration during 1917 was 164,530. The registry office is overwhelmed with applications for new licenses, applications coming at the rate of nearly 3,000 a day. It is figured that not less than 200,000 licenses will be issued during 1918, while many believe the number may reach 225,000.

Historic Inn Destroyed by Fire—Pole Tavern, Pittsgrove, N. J., for over a century a mecca for sleighing and dance parties, and later for motorists, has been totally destroyed by fire of unknown origin. Built in 1740 and of substantial construction, it had been preserved practically intact. It was one of the chief stopping places in pre-railroad days of the stage-coach line from Bridgeton, N. J., to Philadelphia, and had become famous throughout the state. Holding a liquor license for 178 years continuously, Pole Tavern had lately been menaced by the recently passed local option law, and its destruction will practically mean the end of liquor selling in the township.

Dealers Help in University Training—The motor car dealers of the city are furnishing the University of Cincinnati with cars and engines in its work as a training station for soldiers who eventually will belong to motor squads in the army. One dealer alone has turned over eight cars besides other equipment such as rear axles, steering gear, etc.

Jersey Roads Unusually Good Now—In spite of the most severe winter in years, the roads in New Jersey are in unusually good springtime condition. Although they were frozen to a depth of over 4 ft. in January, heavy and lasting snows drew the frost out gradually, so that when the snow was gone there remained less than 2 in. of frost, and there was practically no miring of vehicles.

Missouri Watches County Roads—Road drag inspectors under the direction of the Missouri highway board will report counties where inter-county seat roads are not dragged properly. In many counties the highway boards allow road drag funds to accumulate and no effort is made to put the roads in proper condition after each rain. The law provides $15 per mile per year to drag or otherwise improve the 11,300 miles of inter-county seat highways in Missouri.

1,895 Miles on 115 Gals. Gasoline—The Fisher family of Carlton, Texas, has just made a trip through West Texas, New Mexico and Arizona of 1,895 miles altogether in an Overland light four with a two-wheel trailer attached. The party consisted of Mr. and Mrs. R. E. Fisher and their daughter. The trailer and contents weighed 920 lbs., the car and contents 3,117 lbs. a total weight of 4,037 lbs. Gasoline mileage averaged 17 m.p.g. The trip took thirty-one days.

Alberta Needs More Cars Now—The increase in the number of permits issued in Province Alberta during 1917 to 20,624 from 9,707 for 1916, the revenue received being $269,786.90, against $129,212.25. The record for the twelve years beginning 1905 demonstrates the growing wealth of the agricultural community of the province, the increase being in the main attributive to the enhanced purchasing ability of the farmers of Alberta. In 1906 the number of permits issued was 41 and the revenue $123.

M. A. D. Postpones Used Car Show—The lack of a suitable exposition hall has compelled the Milwaukee Auto Dealers, Inc., Milwaukee, Wis., to postpone indefinitely the second annual used car show, which it was planned to hold during the latter part of April. The first show a year ago was a brilliant success and was to have been repeated this year. However, the auditorium is undergoing extensive alterations to provide a new exhibit hall equal in size to the main arena, and this precludes the use of the big building until after June 1.

New Jersey Examines Motorcyclists—Under a new law that has just taken effect in New Jersey, motorcyclists must take the same course as motor car drivers in obtaining operators' licenses. A permit must be obtained to learn to drive. Then a road test and a written examination must be passed. All motorcyclists who obtained licenses after January 1, 1918, have been called back and subjected to the double test. The license fees under the new system are: Permit, 50 cents; driver's license, $1; registration, $2. Prior to the passage of this law the one fee of $2 covered everything.